10. Consonants & contoids (2)

Luciano Canepari's 2012 updating of *canIPA* contoids in *Natural Phonetics & Tonetics*

10.01. For the sake of thoroughness and to facilitate finding and memorizing the various consonantal articulations, we have to consider some *lists*, which may not be considered just entertaining, but are however something necessary. By grouping them into seven sections, with internal subdivisions, we will provide some 500 articulations (although there can certainly be others, by combining further places and manners of articulation). They will appear after the rich, but partial, table (*fig* 10.1).

Obviously, diphonic pairs count as one articulation, not as two. Therefore, in practice, every articulation can produce a diphonic pair, with two contoids which are distinguished only by their phonation type (*ie* voiced or voiceless).

In the table of *fig* 10.1 (which is long and therefore divided into three parts, to avoid reducing it too much and make it indecipherable), we will give only the (more than) 300 'commonest' or most 'important' articulations (out of the almost 500 included in the lists), depending on vertical and horizontal axes, for more than 500 contoids (out of the some 800 included in *NPT* (and in *fig* 10.2-8). The signs › (which alternate with the names of the manners provided, on the left side) indicate the 'intermediate' manners, which do not appear in the table. Thus, the table of contoids, although occupying three pages (*fig* 10.1), is merely indicative, giving only about 70% of all articulations. And, of course, the orograms show much better than definitions their real articulations, also by comparing similar orograms.

Table of the main *canIPA* contoids

10.02. We will now give the *table* of the main *contoids* belonging to the *canIPA* alphabet. It will emerge rather clearly that unitary symbols are preferable to the official ones which need so many diacritics in order to be exact.

However, the way they are placed in the table is quite sufficient to make their values clear (as happens to the vocoids in the vocogram), especially if they are coupled with their orograms (which are to be analyzed very carefully).

canIPA contoids (displayed according to articulation manners)

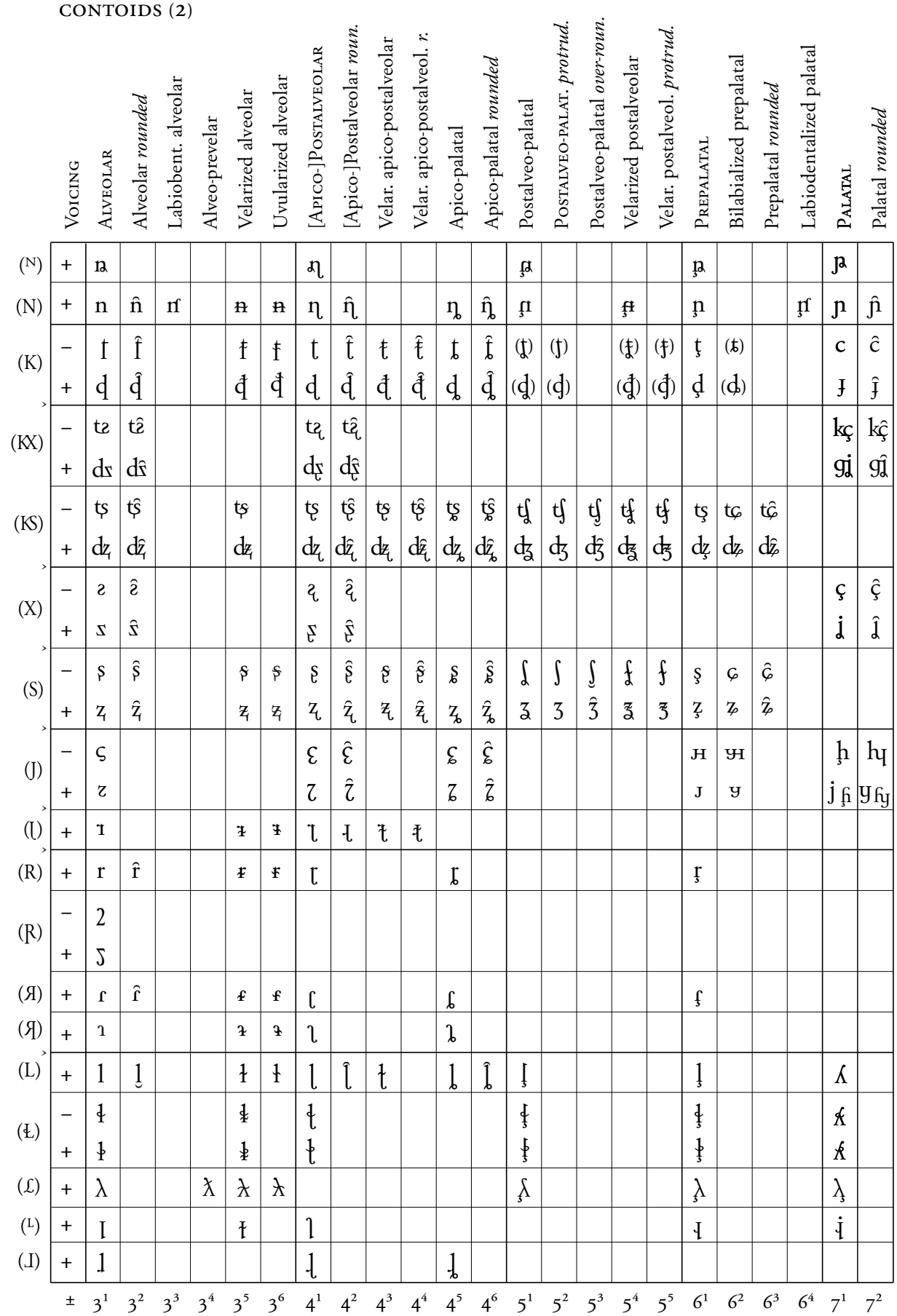
10.1. In our lists, in double square brackets, less common –but more precise– symbols appear, which can be rendered with more 'normal' symbols, given in simple brackets – in less sophisticated transcriptions, once their exact articulations are clearly known.

fig 10.1. *canIPA* contoids (more than 300 *articulations* out of almost 500, and more than 500 *phones* out of almost 800, *cf fig* 10.1-7).

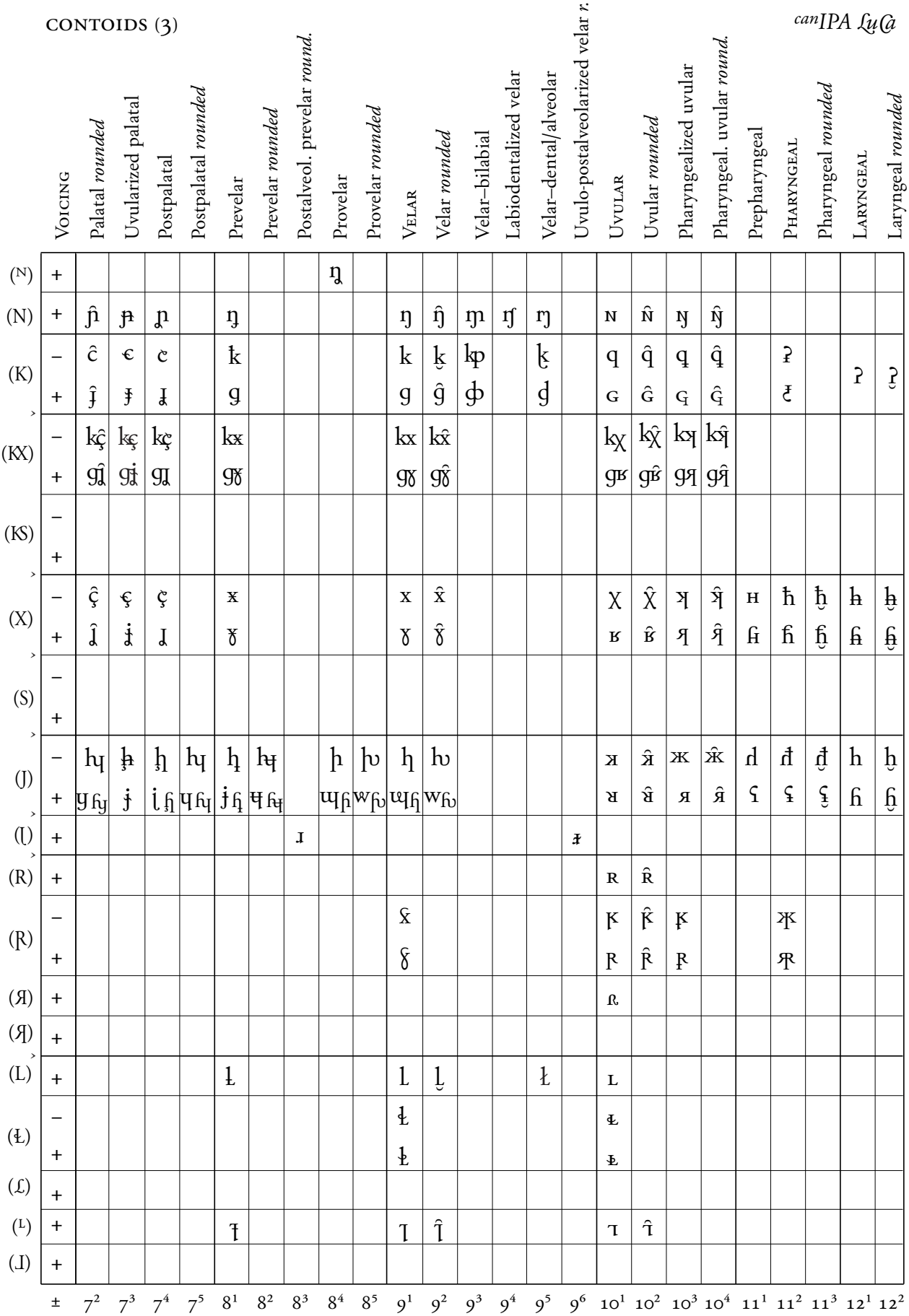
CONTOIDS (1)

	Voicing	Bilabial	Bilabial *rounded*	Palatalized bilabial	Uvularized bilabial	Labial-apical	Labiodental	Labiodental *round.*	Palatal. labiodental	Uvular. labiodental	Dental–bilabial	Pre-dental	Pro-dental	Dental	Dental *rounded*	Labiodent. dental	Uvularized dental	Denti-alveolar	Alveolar
Semi-nasal (N)	+	m̥					ɱ̊												n̥
Nasal (N)	+	m	m̂	m̠	m̰	m̼	ɱ	m̂	m̠	m̰	ɾɱ			n	n̂		n̰	n̼	n
Stop (K)	−	p	p̂	p̠	p̰	p̼	ɸ				t̪p	t		t	ţ	t̪	t̰	t̼	ʈ
	+	b	b̂	b̠	b̰	b̼	β				d̪b	d		d	ɖ	d̪	d̰	d̼	ɖ
Stop-strictive (KX)	−	p͡p	p͡p̂				p͡f					t͡θ		t͡θ	ţ͡θ	t̪͡θ	t̰͡θ		tʂ
	+	b͡β	b͡β̂				b͡v					d͡ð		d͡ð	ɖ͡ð	d̪͡ð	d̰͡ð		dʐ
grooved stop-str. (KS)	−											(t͡s)		t͡s	t͡ŝ	t̪͡s		t͡s	ʈ͡ʂ
	+											(d͡z)		d͡z	d͡ẑ	d̪͡z		d͡z	ɖ͡ʐ
Constrictive (X)	−	ɸ	ɸ̂	ɸ̠	ɸ̰	ɸ̼	f	f̂	f̠	f̰		θ	θ	θ	θ̂		θ̰		ʂ
	+	β	β̂	β̠	β̰	β̼	v	v̂	v̠	v̰		ɻ	ð	ð	ð̂		ð̰		ʐ
grooved constric. (S)	−												s	s	ŝ	s̪	s̰	s	ʂ
	+												z	z	ẑ	z̪	z̰	z	ʐ
Approximant (J)	−	ɸ̞	ɸ̞̂	ɸ̞̠	ɸ̞̰		ʏ	ʏ̂	ʏ̠	ʏ̰				ʊ̞					ɕ
	+	β̞	β̞̂	β̞̠	β̞̰		ʋ	ʋ̂	ʋ̠	ʋ̰				ð̞					ʑ
lateralized app. (l̞)	+													ɻ					ɹ
Trill (R)	+	ʙ												(r)					r
constrictive trill (ʀ̞)	−																		ʡ
	+																		ʢ
tap (ɾ̼)	+	ɾ̥					ⱱ							(ɾ)					ɾ
flap (ɽ)	+						ʋ̆												ɹ
Lateral (appr.) (L)	+					ɭ̥								l	l̥		ɬ	ɮ	l
lateral *constrictive* (ɬ)	−													ɬ					ɮ
	+													ɮ					ɬ
*uni*later. (appr.) (ʟ)	+													ʎ					ʎ
*semi*lateral (ˡ)	+																		l
lateral *tap* (ɺ)	+																		ɭ
	±	0^1	0^2	0^3	0^4	0^5	1^1	1^2	1^3	1^4	1^5	2^1	2^2	2^3	2^4	2^5	2^6	2^7	3^1

CONTOIDS (2)


Voicing
Alveolar
Alveolar *rounded*
Labiobent. alveolar
Alveo-prevelar
Velarized alveolar
Uvularized alveolar
[Apico-]Postalveolar
[Apico-]Postalveolar *roun.*
Velar. apico-postalveolar
Velar. apico-postalveol. *r.*
Apico-palatal
Apico-palatal *rounded*
Postalveo-palatal
Postalveo-palat. *protrud.*
Postalveo-palatal *over-roun.*
Velarized postalveolar
Velar. postalveol. *protrud.*
Prepalatal
Bilabialized prepalatal
Prepalatal *rounded*
Labiodentalized palatal
Palatal
Palatal *rounded*
(N)
(N)
(K)
(KX)
(KS)
(X)
(S)
(J)
(l)
(R)
(ʀ)
(ʁ)
(ʁ)
(L)
(ɬ)
(ʃ)
(ɭ)
(ɾ)
±

CONTOIDS (3) *canIPA Lyca*



For *sonant* (or *sonorant*, *cf* § 11.21) phones, which are more often voiced, we will indicate the rarest voiceless phones in round brackets (in the lists). Instead, we will indicate less frequent articulations, which are given near more normal ones (and represented by the same symbols), by putting them in round brackets (in the figures).

When no symbol is given in square brackets, it is substituted with /. For voiceless phones this appears first, while it is shown last for voiced phones. Thus, any possible ambiguity is avoided. Obviously, a symbol appearing alone stands for a laryngeal stop (or a phone with mixed phonation, or else with the phonation type indicated by the corresponding laryngogram).

An eight-pointed asterisk, *, placed before the lips of a given orogram, highlights the few canonical articulations, which constitute the frame of the official consonant inventory (although, somehow, *canIPA* and *offIPA* symbols do not fully correspond). Finally, a small ring, °, indicates that that articulation does not appear in the table of *fig* 10.1 (which –otherwise– would become impossible to handle and see adequately).

In these synopses, we will use the most precise symbols, to couple each articulation exactly with its symbol, although for some of these, generally, commoner symbols can be used (as can be seen in § 10.2-8).

For all our articulations (with their unitary symbols), we thought it useful to add the corresponding *offIPA* 'transcriptions' (given within ' '), in order to show their 'composition' (almost as in chemical or algebraic formulae).

This will be useful both to understand the combinations of the few basic symbols with so many diacritics (even if we did not use all those which could have been necessary for absolute precision), and to highlight that it is unthinkable to do 'diacritical transcriptions', as all other 'phonetic alphabets' do.

Among the fundamental criteria of the original *IPA*, in fact, was also that of avoiding articulatory diacritics. Let us recall that it is paramount to carefully observe the orograms, to constantly compare them, and to find similarities between symbols too, by starting from the official ones, from which the others have been derived (although with useful modifications and some necessary substitutions).

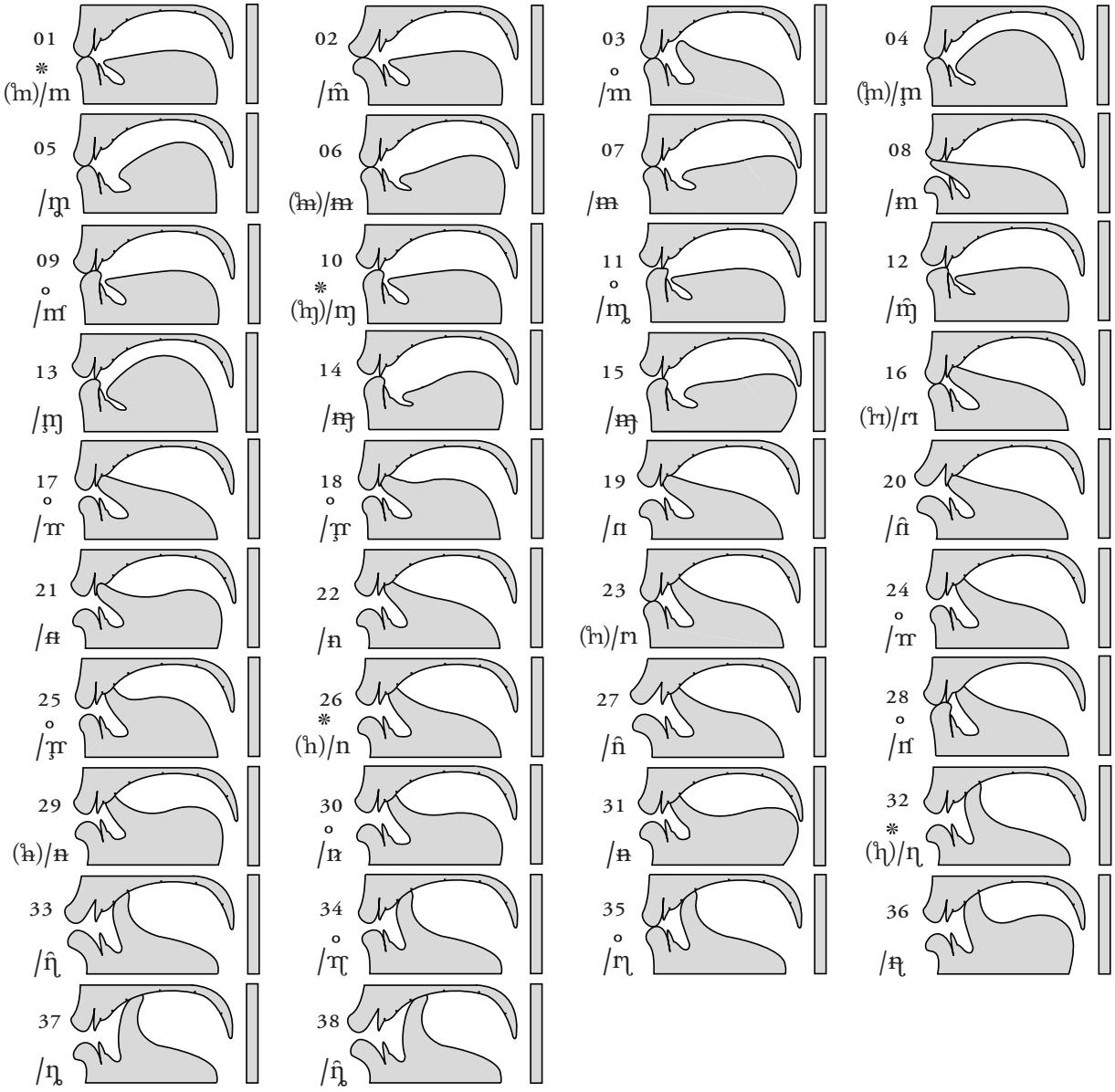
Nasals /N/ [N, ᴺ] (75)

10.2. These include three synopses grouped into 'front', 'back', and 'semi-nasal' (which have no complete occlusion between the articulators).

10.2.1. *Front* nasals [N] (38).

[(ɬm), m]01 bilabial (= between the lips) '[m̥, m]' (≠, =)
[/, m̂]02 bilabial rounded (= bilab. with lip rounding) '[mʷ]'
[[/, m̼]]03 alveolarized bilabial (= bilab. w. tip approach. alv. ridge, without contact) '[m͡n̪]'
[(ʃm), m̠]04 palatalized bilabial '[m̥ʲ, mʲ]'
[/, m̽]05 prevelarized bilabial '[m̥˖, m˖]'
[(ɬ̵m), m̵]06 velarized bilabial '[m̥˗, m˗]'
[/, m̵]07 [[m̵]] uvularized bilabial '[m̝]'
[/, m̬]08 labial-apical (= between the upper lip and the tip of the tongue) '[m̼]'
[[/, mᶠ]]09 [m] labiodentalized bilabial '[mᵛ]'
[(ɬɱ), ɱ]10 labiodental (= between the lower lip and the upper teeth) '[m̊ɱ, ɱ]' (≠, =)
[/, ɱ̟]11 hyper-labiodental (= labiodent., w. firmer contact, no air passes betw. teeth) '[m̪ɱ]'
[/, m̂ɱ]12 labiodental rounded (= labiodent. + lip rounding) '[ɱʷ]'
[/, m̠ɱ]13 palatalized labiodental '[ɱʲ]'
[/, m̽ɱ]14 velarized labiodental '[ɱ˖]'
[/, m̵ɱ]15 [[m̵ɱ]] uvularized labiodental '[ɱ̝]'
[[(ɬn), nˡ]]16 [(ɬn), nˡ] dental–bilabial (= *simult.* dent. & bilab.) '[m͡n̪]'
[[/, n̼]]17 bilabialized dental (= with secondary labialization) '[n̪͡m̪]'
[[/, n̠]]18 bilabialized palatalized dental (= with secondary labializ. & palataliz.) '[n̪͡m̪ʲ]'
[[/, n̬]]19 [n] dental, or prodental (= dent. with a *lowered* or *raised* tip) '[n̪] or [n̺]'
[[/, n̂]]20 [n̂] dental rounded '[n̪ʷ]'
[[/, n̵]]21 [n̵] uvularized dental '[n̪̝]'
[[/, n̵]]22 [n] denti-alveolar (or postdental, or prealveolar) '[n̻]'
[(ɬn), nˡ]23 alveolar–bilabial (= *simult.* alveol. & bilab.) '[n̻ʷ, n̻ʷ]' or '[n̻͡m, n̻͡m]'
[[/, n̼]]24 bilabialized alveolar '[n̻͡m̪]'
[[/, n̠]]25 labio-palatalized alveolar (= with second. labializ. & palataliz.) '[n̻͡m̪ʲ]'
[(ɬ), n]26 alveolar (= between the alveoli and the tip of the tongue) '[n̺, n̻]' (≠, ≡)
[/, n̂]27 alveolar rounded '[n̻ʷ]'
[[/, nᶠ]]28 [n] labiodentalized alveolar '[n̻ᵛ]'
[(ɬ̵), n̵]29 velarized alveolar '[n̻˗, n̻˗]'
[[/, n̵]]30 [n̵] semi-velarized alveolar (with very slight velariz.) '[n̻̝]'
[[n̵]]31 [n̵] uvularized alveolar '[n̻̝, n̻̝]'
[(ɬ), ɳ]32 postalveolar: (apico-)… (= not laminal) '[n̊ˌ, ɳ]' (≠, =)
[/, n̂ˌ]33 postalveolar rounded: (apico-)… '[ɳʷ]'
[[/, nˌ]]34 labialized postalveolar '[ɳ͡m̪]'
[[/, ɳ]]35 postalveolar–bilabial: (apico-)… (= *simult.* postalveol. & bilab.) '[ɳ͡m]'
[[/, n̵ˌ]]36 velarized postalveolar: (apico-)… '[ɳ͡m˗]'
[/, n̻]37 apico-palatal (= between the [hard] palate and the tip) '[n̻̠]'
[/, n̻̂]38 apico-palatal rounded (with lip rounding) '[n̻̠ʷ]'.

fig 10.2.1. *Front* nasal orograms (38).

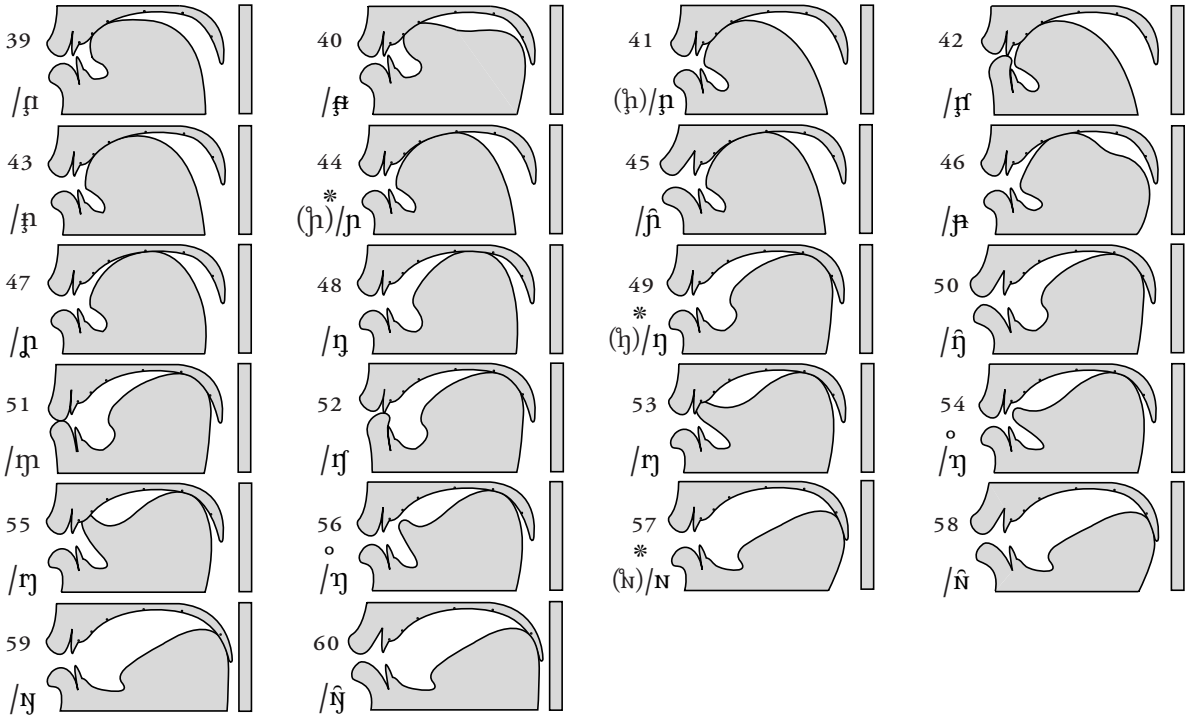


10.2.2. *Back* nasals [N] (22).

[[/, ɻ̟]][39]	[ɻ̟] postalveo-palatal: (lamino-)… '[ɻ̟̊, ɻ̟̃]'
[[/, ʁ̟]][40]	[ʁ̟] velarized postalveo-palatal: (lamino-)… '[ɻ̟̃ˠ]'
[(ʰ), ɲ̟][41]	pre-palatal: (lamino-)… (= between the prepalate and the lamina) '[ɲ̟̊ʲ, ɲ̟̃ʲ]'
[[/, ɲ̟]][42]	labiodentalized pre-palatal: (lamino-)… '[ɲ̟̃ᵛʲ]'
[/, ɲ̠][43]	pro-palatal (= between prepalatal and palatal) '[ɲ̠]' (≠)
[(ʰ), ɲ][44]	palatal (= between the [hard] palate and the [medio]dorsum) '[ɲ̊, ɲ]' (≠, =)
[/, ɲ̂][45]	palatal rounded '[ɲʷ]'
[/, ɲ̈] [[ɲ̈]][46]	uvularized palatal '[ɲ̽ˠ]'
[[/, ɲ̠]][47]	[ɲ] postpalatal (= retracted palatal or advanced prevelar) '[ɲ̄]'
[[/, ŋ̟]][48]	[ŋ] prevelar (= between the prevelum and the [post]dorsum) '[ŋ̟]'
[(ʰ), ŋ][49]	velar (= between the velum and the [post]dorsum) '[ŋ̊, ŋ]' (≠, =)
[/, ŋ̂][50]	velar rounded (with lip rounding) '[ŋʷ]'

[/, ŋ̼][51] velar–bilabial (= *simult.* velar and bilabial) '[ŋ͡m]'
⟦/, ŋ̪⟧[52] [/, ŋ] labiodentalized velar '[ŋʲ]'
[/, ŋ̺][53] velar–dental (= *simult.* velar and dental) '[ŋ͡n̪]'
⟦/, ŋ̟⟧[54] dentalized velar (with secondary dentalization) '[ŋ̟͡n̪]'
[/, ŋ̻][55] velar–alveolar (= *simult.* velar and alveolar) '[ŋ͡n̻]'
⟦/, ŋ̠⟧[56] alveolarized velar '[ŋ̟͡n̻]'
[(ɴ̝), ɴ][57] uvular (= between the uvula and the [post]dorsum) '[ɴ̝, ɴ]' (≠, =)
[/, ɴ̂][58] uvular rounded '[ɴʷ]'
[/, ɴ̞][59] pharyngealized uvular '[ɴˤ] or [ɴ̞]'
[/, ɴ̞̂][60] pharyngealized uvular rounded '[ɴˤʷ] or [ɴ̞ʷ]'.

ƒig 10.2.2. *Back* nasal orograms (21).

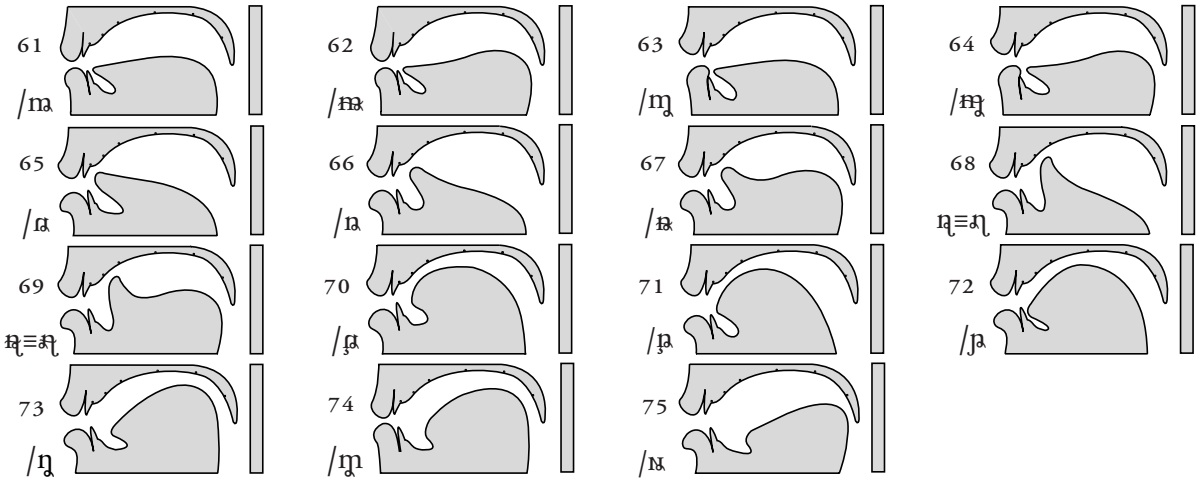


10.2.3. *Semi-nasal*, or *semi-… nasal* (15).

⟦/, m̥⟧[61] [m] *semi*-bilabial (= bilabial, but with no full contact) '[m̥]'
⟦/, m̥ˠ⟧[62] [m] velarized *semi*-bilabial (= bilabial, with no full contact & velarization) '[m̥ˠ]'
⟦/, m̪̊⟧[63] [m̪] *semi*-labiodental (= labiodental, with no full contact) '[m̪̊]'
⟦/, m̪̊ˠ⟧[64] [m̪] velarized *semi*-labiodental (= betw. lower lip and upper teeth & velariz.) '[m̪̊ˠ]'
⟦/, n̪̊⟧[65] [n] *semi*-dental (= dental, with no full contact) '[n̪̊]'
⟦/, n̥⟧[66] [n] *semi*-alveolar (= alveolar, with no full contact) '[n̥]'
⟦/, n̥ˠ⟧[67] [n] velarized *semi*-alveolar (= alveolar, with no full contact & velarization) '[n̥ˠ]'
⟦/, ɳ̊⟧[68] (or ⟦ɳ̥⟧) [ɳ] *semi*-postalveolar (= postalveolar, with no full contact) '[ɳ̊]'
⟦/, ɳ̊ˠ⟧[69] (or ⟦ɳ̥ˠ⟧) [ɳ] velarized *semi*-postalveolar (= postalveolar… with no full contact) '[ɳ̊ˠ]'
⟦/, ɲ̊⟧[70] [ɲ] *semi*-postalveo-palatal (= postaveopalatal, with no full contact) '[ɲ̊]'
⟦/, ɲ̥⟧[71] [ɲ] *semi*-prepalatal (= prepalatal, with no full contact) '[ɲ̊ʲ]'
⟦/, ɲ̥⟧[72] [ɲ] *semi*-palatal (= with no full contact) '[ɲ̊]'
⟦/, ŋ̊⟧[73] [ŋ] *semi*-provelar (= provel., with no full contact) '[ŋ̊]'

⟦/, ɱ̊⟧[74] [m] *semi*-velar–bilabial (= *simult.* velar and bilabial, with no full contact) '[n̠͡m̥]'
⟦/, ɴ̠⟧[75] [ɴ] *semi*-uvular (= uvular, with no full contact) '[ɴ̥]'.

fig 10.2.3. Semi-nasal orograms (15).



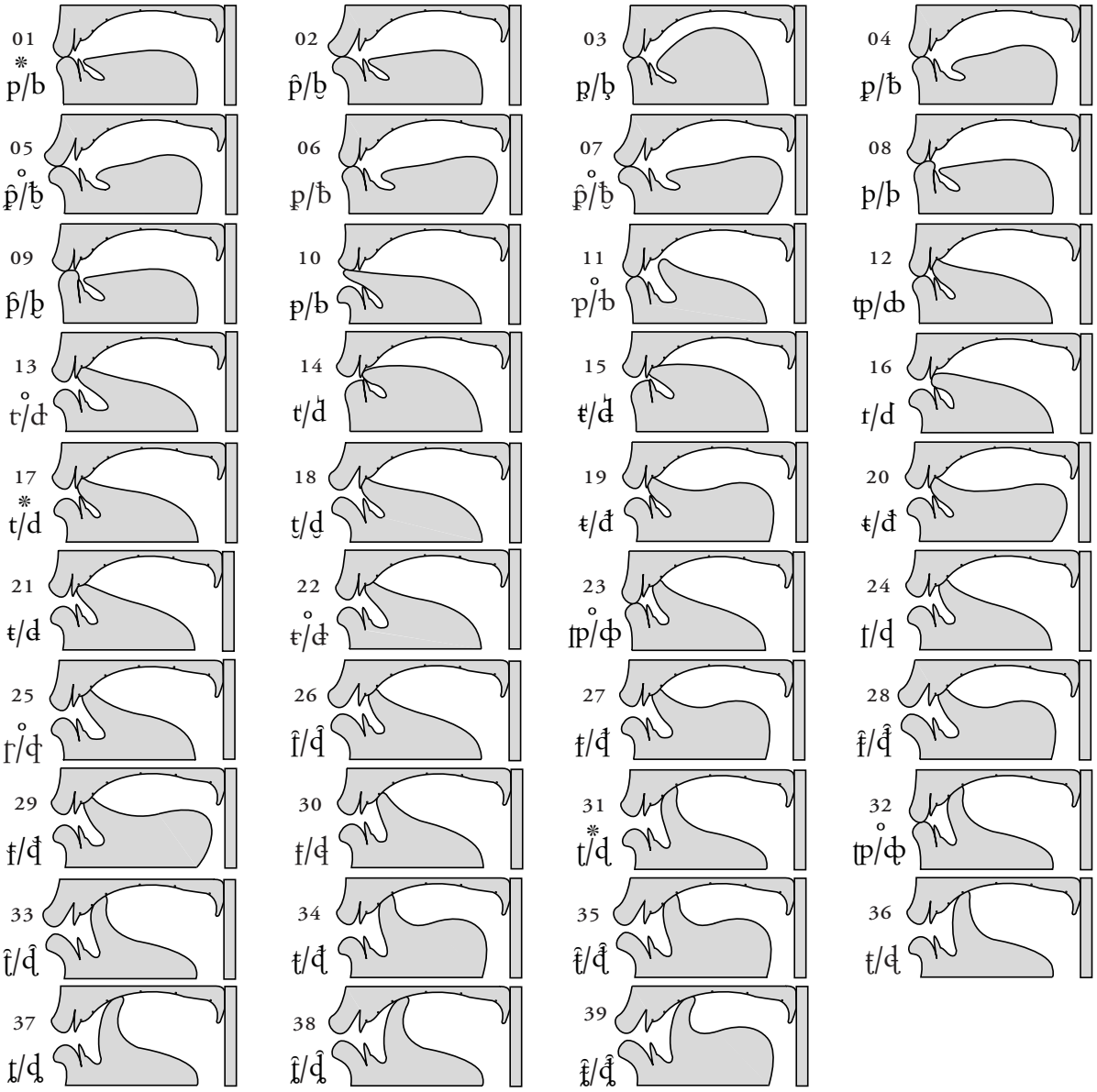
Stops /K/ [K, ᴷ] (*76*)

10.3. These include four synopses: front, back, and laryngeal; with the addition of some 'semi-stops'.

10.3.1. *Front* stops [K] (39).

[p, b]⁰¹ bilabial (= between the lips) '[p, b]' (=)
[p̂, b̂]⁰² bilabial rounded (= bilabial with lip rounding) '[pʷ, bʷ]'
[p̧, b̧]⁰³ palatalized bilabial '[pʲ, bʲ]'
[p̠, b̠]⁰⁴ velarized bilabial '[pˠ, bˠ]'
[p̠̂, b̠̂]⁰⁵ velarized bilabial rounded '[pˠʷ, bˠʷ]'
[p̠, b̠]⁰⁶ ⟦p̠, b̠⟧ uvularized bilabial '[p̠̲, b̠̲]'
[p̠̂, b̠̂]⁰⁷ ⟦p̠̂, b̠̂⟧ uvularized bilabial rounded '[p̠̲ʷ, b̠̲ʷ]'
⟦p, b⟧⁰⁸ [p, b] labiodental (=between the lower lip and the upper teeth) '[pᵛ, bᵛ]'
⟦p̂, b̂⟧⁰⁹ [p, b] labiodental rounded (=between lower lip and upper teeth) '[pᵛʷ, bᵛʷ]'
[p̪, b̪]¹⁰ labial-apical (= between the upper lip and the tip of the tongue) '[t̪, d̪]'
⟦p̪, b̪⟧¹¹ semi-alveolarized bilabial (= bilab. with tip approaching alveoli, no contact) '[p͡t̪̞, b͡d̪̞]'
[t̪p, d̪b]¹² dental–bilabial (= *simult.* dent. & bilab.) '[t̪͡p, d̪͡b]'
⟦t̪, d̪⟧¹³ semi-labialized dental (= with secondary labialization) '[t̪͡pʷ, d̪͡bʷ]'
⟦t̪̠, d̪̠⟧¹⁴ [t, d] labiodentalized dental (with a *lowered* tip) '[t̪̠ᵛ, d̪̠ᵛ]'
⟦t̪̠, d̪̠⟧¹⁵ ⟦t̪, d̪⟧ [t, d] labiodentalized denti-alveolar (with a *raised* tip) '[t̪̠̲ᵛ, d̪̠̲ᵛ]'ɬɗ
⟦t̪, d̪⟧¹⁶ [t, d] dental, or predental (with a *lowered* tip) '[t̪̞, d̪̞]'
[t, d]¹⁷ dental, or lamino-dental (with a *raised* tip) '[t̪, d̪]'
[t̪, d̪]¹⁸ dental rounded '[t̪ʷ, d̪ʷ]'
[t̪̠, d̪̠]¹⁹ velarized dental '[t̪̠ˠ, d̪̠ˠ]'
[t̪̠, d̪̠]²⁰ ⟦t̪̠, d̪̠⟧ uvularized dental '[t̪̠̲ˠ, d̪̠̲ˠ]'
⟦t̪̠, d̪̠⟧²¹ [t, d] denti-alveolar (or postdental, or prealveolar) (with *raised* tip) '[t̪̲, d̪̲]'
⟦t̪̠, d̪̠⟧²² semi-labialized denti-alveolar (with no firm bilabial contact) '[t̪̲͡pʷ, d̪̲͡bʷ]'
[t̪p, d̪b]²³ alveolar–bilabial (= *simult.* alveol. & bilab.) '[t̪͡p, d̪͡b]'
[ɾ, ɖ]²⁴ alveolar (= between the alveoli and the tip of the tongue) '[t̺, d̺]'
⟦ɾ, ɖ̠⟧²⁵ semi-labialized alveolar (with no firm bilabial contact) '[t̺͡pʷ, d̺͡bʷ]'
[ɾ̂, ɖ̂]²⁶ alveolar rounded (with lip rounding) '[t̺ʷ, d̺ʷ]'
[ɾ̠, ɖ̠]²⁷ velarized alveolar '[t̺ˠ, d̺ˠ]'
[ɾ̠, ɖ̠]²⁸ ⟦ɾ̠, ɖ̠⟧ uvularized alveolar '[t̺̠̲ˠ, d̺̠̲ˠ]'
[ɾ̠̂, ɖ̠̂]²⁹ velarized alveolar rounded '[t̺ˠʷ, d̺ˠʷ]'
[ɻ, ɭ]³⁰ back-alveolar: (apico-)… (= not laminal) '[ɻ̺, ɖ̺]'
[ʈ, ɖ]³¹ postalveolar: (apico-)… (= not laminal) '[ʈ, ɖ]' (=)
[ʈp, ɖb]³² postalveolar–bilabial: (apico-)… (= *simult.* postalveol. & bilab.) '[ʈ͡p, ɖ͡b]'
[ʈ̂, ɖ̂]³³ postalveolar rounded: (apico-)… '[ʈʷ, ɖʷ]'
[ʈ̠, ɖ̠]³⁴ velarized postalveolar: (apico-)… '[ʈˠ, ɖˠ]'
[ʈ̠̂, ɖ̠̂]³⁵ velarized postalveolar rounded: (apico-)… (with lip rounding) '[ʈˠʷ, ɖˠʷ]'
[ʈ̠, ɖ̠]³⁶ back-postalveolar: (apico-)… (= not laminal) '[ʈ̺, ɖ̺]'
[ʃ̺, ʒ̺]³⁷ apicopalatal (= between the [hard] palate and the tip) '[ʃ̺̲, ʒ̺̲]'
[ʃ̺̂, ʒ̺̂]³⁸ apicopalatal rounded (with lip rounding) '[ʃ̺̲ʷ, ʒ̺̲ʷ]'
[ʃ̠̺̂, ʒ̠̺̂]³⁹ velarized apicopalatal rounded (with lip rounding) '[ʃ̺̲ˠʷ, ʒ̺̲ˠʷ]'.

fig 10.3.1. *Front* stop orograms (39).

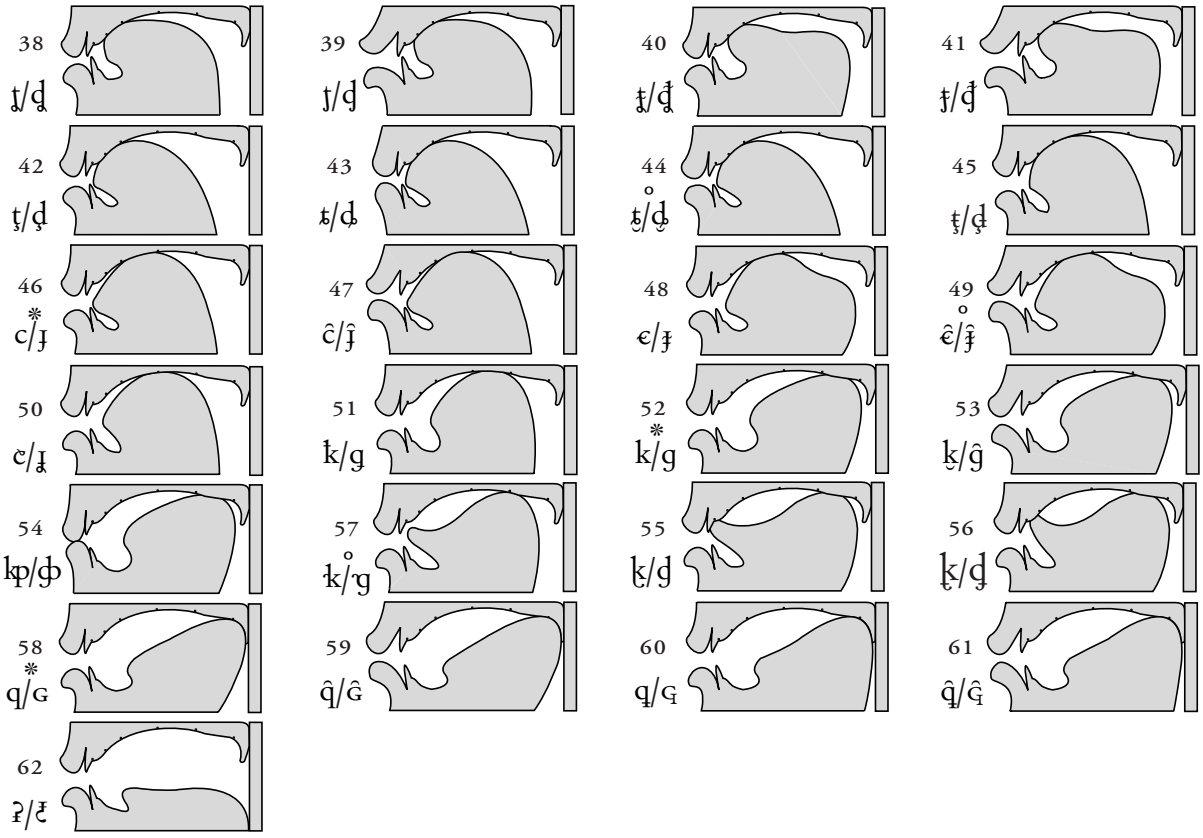


10.3.2. *Back* stops [K] (25).

⟦ʂ, ʐ⟧[38] postalveo-palatal: (lamino-)… '[t̪ʲ, d̪ʲ]'
⟦ʃ, ʒ⟧[39] postalveo-palatal protruded: (lamino-)… '[t̪ʲʷ, d̪ʲʷ]'
⟦ʂ̟, ʐ̟⟧[40] postalveo-velar: (lamino-)… '[t̪ʲɣ, d̪ʲɣ]'
⟦ʃ̟, ʒ̟⟧[41] postalveo-velar protruded: (lamino-)… '[t̪ʲɣʷ, d̪ʲɣʷ]'
[ʂ, ʐ][42] pre-palatal: (lamino-)… (= between the prepalate and the lamina) '[t̪ʲ, d̪ʲ]'
[ɕ, ʑ][43] labialized prepalatal (with vertical labialization): (lamino-)… '[t̪ʲβ, d̪ʲβ]'
[ɕ̞, ʑ̞][44] pre-palatal rounded: (lamino-)… '[t̪ʲʷ, d̪ʲʷ]'
[ʂ̠, ʐ̠][45] pro-palatal (= between prepalatal and palatal) '[c⁺, ɟ⁺]' (≠)
[c, ɟ][46] palatal (= between the [hard] palate and the [medio]dorsum) '[c, ɟ]' (=)
[ĉ, ĵ][47] palatal rounded '[cʷ, ɟʷ]'
[ɕ, ʑ][48] ⟦ɕ, ʑ⟧ uvularized palatal '[c̠ˠ, ɟ̠ˠ]'
[ĉ, ĵ][49] ⟦ĉ, ĵ⟧ uvularized palatal rounded '[c̠ˠʷ, ɟ̠ˠʷ]'

[ʗ, ʄ][50] [c, ɟ] postpalatal (= retracted palatal or advanced prevelar) '[c̠, ɟ̠]'
[ʞ, ɠ][51] [k, g] prevelar (= between the prevelum and the [post]dorsum) '[k̠, ɡ̠]'
[k, g][52] velar (= between the velum and the [post]dorsum) '[k, g]' (=)
[k̟, ĝ][53] velar rounded (with lip rounding) '[kʷ, gʷ]'
[kp, ɡb][54] velar–bilabial (= *simult.* velar and bilabial) '[k͡p, g͡b]'
[ʞ, ɠ][55] semi-dentalized velar (with tip approach. the teeth, but with no contact) '[k͡t̪, g͡d̪]'
[k̟, ɡ̟][56] velar–dental (= *simult.* velar and dental) '[k͡t̪, g͡d̪]'
[ʞ, ɠ][57] [k̟, ɡ̟] velar–alveolar (= *simult.* velar and alveolar) '[k͡t̻, g͡d̻]'
[q, ɢ][58] uvular (= between the uvula and the [post]dorsum) '[q, ɢ]' (=)
[q̂, ĝ][59] uvular rounded '[qʷ, ɢʷ]'
[qˤ, ɢˤ][60] pharyngealized uvular '[qˤ, ɢˤ]'
[q̂ˤ, ĝˤ][61] pharyngealized uvular rounded '[qˤʷ, ɢˤʷ]'
[ʔ, ʡ][62] pharyngeal (= between the lower pharynx and root of tongue, 'epiglottal') '[ʔ, ʡ̞]'.

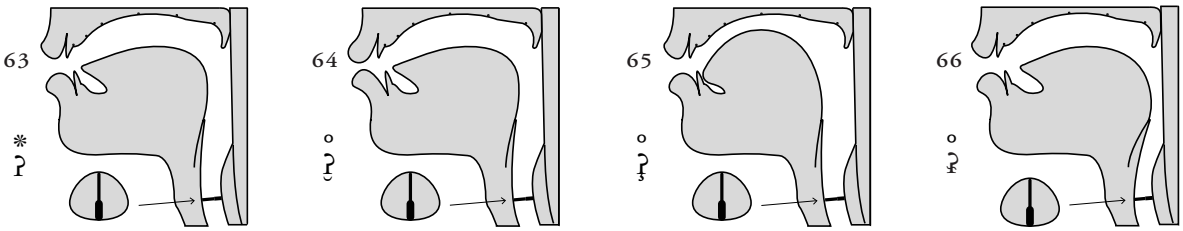
fig 10.3.2. *Back* stop orograms (25).



10.3.3. *Laryngeal* stops [ʔ] (4) – voiceless (or a-voiced, by definition).

[ʔ][63] laryngeal (= between the vocal folds, including the arytenoid cartilages) '[ʔ]' (=)
[ʔ̞][64] [ʔ] laryngeal rounded (with lip rounding) '[ʔʷ]'
[ʔ̟][65] [ʔ] palatalized laryngeal (with the dorsum *raised* towards the [hard] palate) '[ʔʲ]'
[ʔ̠][66] [ʔ] uvularized laryngeal (with the [post]dorsum *raised* towards the uvula) '[ʔ̠]'.

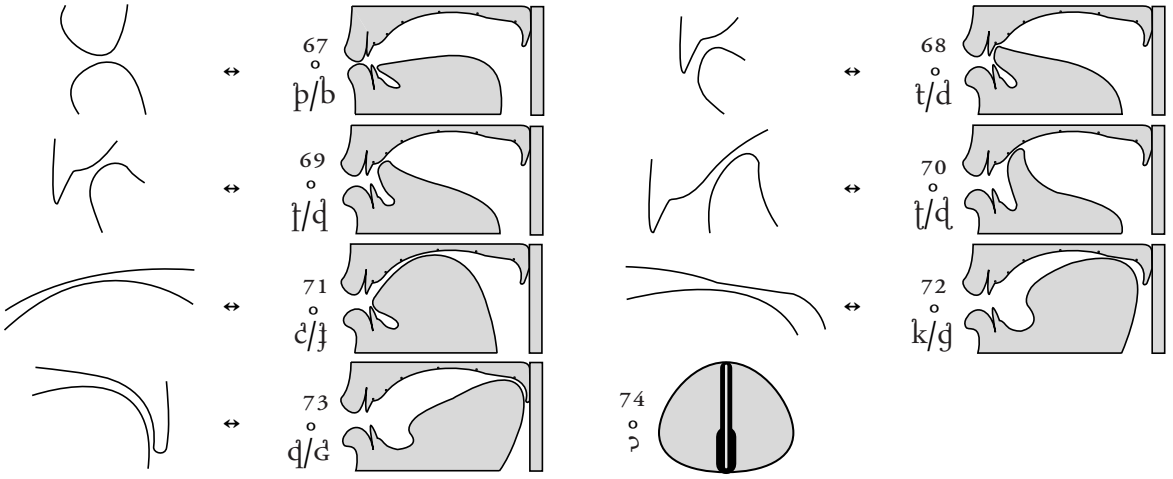
fig 10.3.3. *Laryngeal* stop orograms (4).



10.3.4. Some '*semi*-stops' are also possible, which are less firmly articulated (*ie* with partial occlusion). They remain different both from very tense constrictives and very lax stopstrictives. We will indicate here only those produced at the most important places of articulation, practically the official ones (8). Their generic symbol is [ᴷ], whereas they can be represented with the diacritic shown. It is important to observe well (in the nearby enlargements) the non-contact at the articulation places. For the laryngeal phone *cf fig* 10.3.3, but most of all *cf fig* 4.4.B.

⟦ƥ, ɓ⟧ [ƥ̬, ɓ̬][67]	[p, b] bilabial (with no full contact) '[p̆, b̆]'
⟦t̪, d̪⟧ [t̪̬, d̪̬][68]	[t, d] dentale (with no full contact) '[t̪̆, d̪̆]'
⟦ʈ, ɖ⟧ [ʈ̬, ɖ̬][69]	[ʈ, ɖ] alveolar (with no full contact) '[ʈ̆, ɖ̆]'
⟦c̠, ɟ̠⟧ [c̠̬, ɟ̠̬][70]	[c̠, ɟ̠] postalveolar (with no full contact) '[c̠̆, ɟ̠̆]'
⟦c̻, ɟ̻⟧ [c̻̬, ɟ̻̬][71]	[c, ɟ] palatal (with no full contact) '[c̆, ɟ̆]'
⟦k, ɡ⟧ [k̬, ɡ̬][72]	[k, g] velar (with no full contact) '[k̆, ɡ̆]'
⟦q̻, ɢ̻⟧ [q̻̬, ɢ̻̬][73]	[q, ɢ] uvular (with no full contact) '[q̻̆, ɢ̻̆]'
⟦ʔ⟧ [ʔ̬][74]	[ʔ] laryngeal (with no full contact) '[ʔ̆]'.

fig 10.3.4. *Semi*-stop diagrams (8).



Stop-strictives /K͡Σ/ [K͡X, K^{X}, K͡S, K^{S}, K͡Ł, K͡Ɽ, ^{K}X, ^{K}S] (still called 'affricates' – 112)

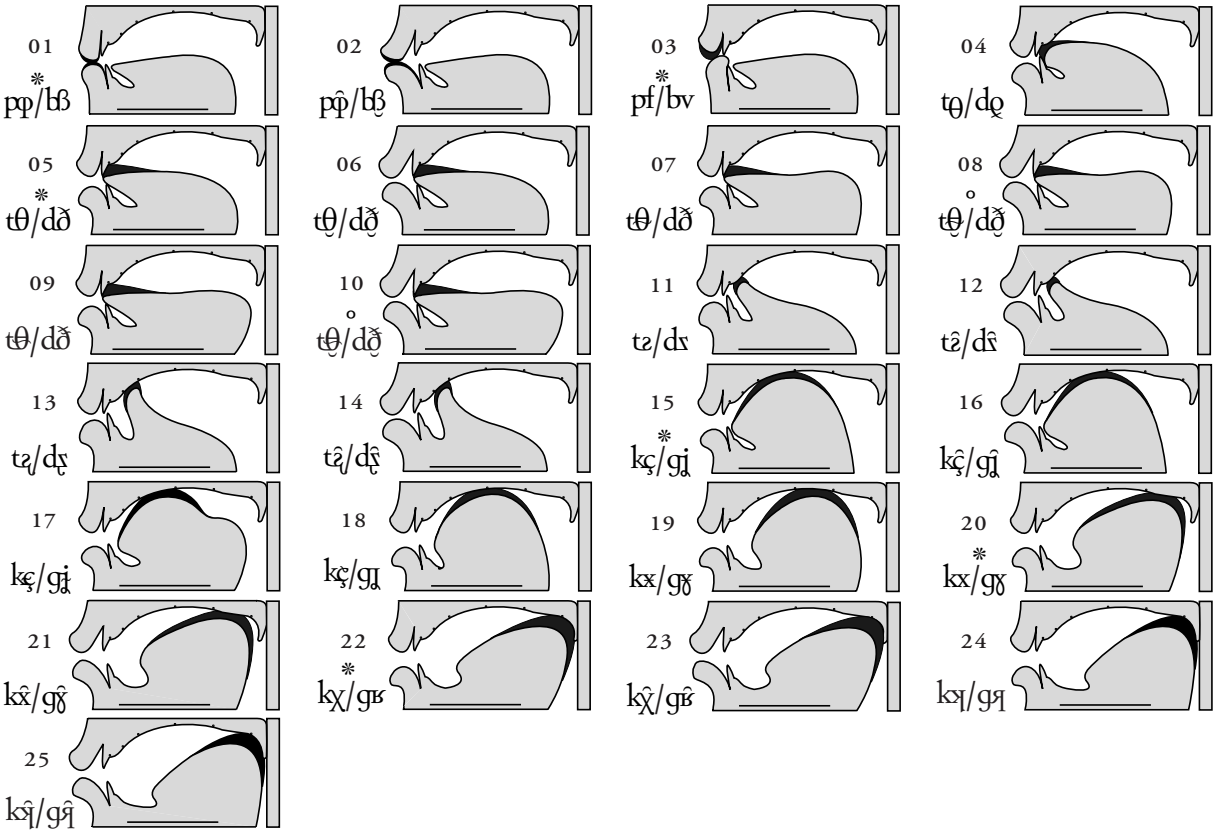
10.4. These include ten synopses of plain (or 'slit', or un-grooved) and grooved phones. Of course, *grooved* refers to the actual groove which can be formed on the tip and lamina of the tongue. Also some laterals and trills are given, since for these phones a stopstrictive manner is frequent.

We include the synopses of stop-*semi*strictives (or stop-*semi*constrictives, with a *semiconstrictive* second element, § 10.4.5-6) and also the synopses of *semi*-stop--strictives. There are two kinds of semistop-strictives: by *detension* and by *proportion*. Those by detension have, as their first element, a semistop (§ 10.3.4 & § 10.4.7-8). Those by proportion have a very short stop as their first element.

10.4.1. Stopstrictives /K͡X/ [K͡X] (25).

[p͡ɸ, b͡β]^{01} bilabial (= between the lips) '[p͡ɸ, b͡β]'
[p͡ɸ̞, b͡β̞]^{02} bilabial rounded (= bilabial with lip rounding) '[p͡ɸ^{w}, b͡β^{w}]'
[p͡f, b͡v]^{03} labiodental (= between the lower lip and the upper teeth) '[p͡f, b͡v]'
[t̪θ̪, d̪ð̪]^{04} dental, or pro-dental (with a *lowered* tip) '[t̪͡θ̪ , d̪͡ð̪]'
[t͆θ, d͆ð]^{05} dental, or lamino-dental (with a *raised* tip of the tongue) '[t͆θ, d͆ð]'
[t͆θ̞, d͆ð̞]^{06} dental rounded (with *raised* tip of the tongue) '[t͆θ^{w}, d͆ð^{w}]'
[t͆θ̈, d͆ð̈]^{07} velarized dental (with *raised* tip) '[t͆θ̞̈, d͆ð̞̈]'
[t͆θ̞̈, d͆ð̞̈]^{08} velarized dental rounded (with *raised* tip) '[t͆θ̞̈^{w}, d͆ð̞̈^{w}]'
[t͆θ̈, d͆ð̈]^{09} [[t͆θ̈, d͆ð̈]] uvularized dental (with *raised* tip) '[t͆θ̞̈, d͆ð̞̈]'
[t͆θ̞̈, d͆ð̞̈]^{10} [[t͆θ̞̈, d͆ð̞̈]] uvularized dental rounded (with *raised* tip) '[t͆θ̞̈^{w}, d͆ð̞̈^{w}]'
[t͡ɹ, d͡ɹ]^{11} alveolar (= between the alveoli and the tip of the tongue) '[t͡ɹ̝, d͡ɹ̝]'
[t͡ɹ̞, d͡ɹ̞]^{12} alveolar rounded (= alveoalr with lip rounding) '[t͡ɹ̝^{w}, d͡ɹ̝^{w}]'
[t͡ɻ, d͡ɻ]^{13} postalveolar: (apico-)… (= not laminal) '[t͡ɻ̟̃, d͡ɻ̟̃]'
[t͡ɻ̞, d͡ɻ̞]^{14} postalveolar rounded: (apico-)… '[t͡ɻ̟̃^{w}, d͡ɻ̟̃^{w}]'
[k͡ç, g͡ʝ]^{15} palatal (= between the [hard] palate and the [medio]dorsum) '[c͡ç, ɟ͡ʝ]'
[k͡ç̞, g͡ʝ̞]^{16} palatal rounded (with lip rounding) '[c͡ç^{w}, ɟ͡ʝ^{w}]'
[k͡ç̈, g͡ʝ̈]^{17} [[k͡ç̈, g͡ʝ̈]] uvularized palatal '[c͡ç̞̈, ɟ͡ʝ̞̈]'
[k͡ç̟, g͡ʝ̟]^{18} postpalatal (= retracted palatal or advanced prevelar) '[c͡ç̟, ɟ͡ʝ̟]'
[[k͡x̠, g͡ɣ̠]]^{19} [k͡x, g͡ɣ] prevelar (= between the prevelum and the [post]dorsum) '[k͡x̠ , g͡ɣ̠]'
[k͡x, g͡ɣ]^{20} velar (= between the velum and the [post]dorsum) '[k͡x, g͡ɣ]'
[k͡x̞, g͡ɣ̞]^{21} velar rounded (with lip rounding) '[k͡x^{w}, g͡ɣ^{w}]'
[k͡χ, g͡ʁ]^{22} uvular (= between the uvula and the [post]dorsum) '[q͡χ, ɢ͡ʁ]'
[k͡χ̞, g͡ʁ̞]^{23} uvular rounded '[q͡χ^{w}, ɢ͡ʁ^{w}]'
[k͡ʀ̝, g͡ʀ̝]^{24} pharyngealized uvular '[q͡ʀ̝̰, ɢ͡ʀ̝̰]'
[k͡ʀ̞̝, g͡ʀ̞̝]^{25} pharyngealized uvular rounded '[q͡ʀ̝̰^{w}, ɢ͡ʀ̝̰^{w}]'.

ʃiɡ 10.4.1. Stop-strictive orograms (25).



10.4.2. *Grooved* stopstrictives /KS/ [KS] (35).

[ʦ, ʣ][26] labiodentalized dental (with a *lowered* tip of the tongue) '[t͡s̪ᵛ, d͡z̪ᵛ]'
[ʦ, ʣ][27] labiodentalized dental (with a *raised* tip of the tongue) '[t͡sᵛ, d͡zᵛ]'
[ʦ, ʣ][28] [[ʦ, ʣ]] uvulo-labiodentalized dental (with a *raised* tip) '[t͡s̪˞ᵛ, d͡z̪˞ᵛ]'
[ʦ, ʣ][29] dental (with a *lowered* tip) '[t͡s̪, d͡z̪]'
[ʦ̂, ʣ̂][30] dental rounded (with a *lowered* tip + lip rounding) '[t͡s̪ʷ, d͡z̪ʷ]'
[[ʦ, ʣ]][31] [ʦ, ʣ] denti-alveolar (with a *raised* tip) '[t͡s̪, d͡z̪]'
[[ʦ̂, ʣ̂]][32] [ʦ̂, ʣ̂] denti-alveolar rounded (with a *raised* tip + lip rounding) '[t͡s̪ʷ, d͡z̪ʷ]'
[ʦ, ʣ][33] alveolar (between the alveoli and the tip) '[t͡s̻, d͡z̻]'
[ʦ̂, ʣ̂][34] alveolar rounded '[t͡s̻ʷ, d͡z̻ʷ]'
[ʦ̫, ʣ̫][35] alveolar protruded '[t͡s̻ʷ̟, d͡z̻ʷ̟]'
[ʦ̠, ʣ̠][36] velarized alveolar '[t͡s̻ˠ, d͡z̻ˠ]'
[ʦ̠̂, ʣ̠̂][37] velarized alveolar rounded (with lip rounding) '[t͡s̻ʷ, d͡z̻ʷ]'
[ʦ̢, ʣ̢][38] postalveolar: (apico-)… (= not laminal) '[t͡ʂ̺, d͡ʐ̺]'
[ʦ̢̂, ʣ̢̂][39] postalveolar rounded: (apico-)… (= not laminal) '[t͡ʂ̺ʷ, d͡ʐ̺ʷ]'
[ʦ̢̠, ʣ̢̠][40] velarized postalveolar: (apico-)… (= not laminal) '[t͡ʂ̺ˠ, d͡ʐ̺ˠ]'
[ʦ̢̠̂, ʣ̢̠̂][41] postalveolar rounded: (apico-)… (= not laminal) '[t͡ʂ̺ˠʷ, d͡ʐ̺ˠʷ]'
[ʦ̻, ʣ̻][42] apicopalatal (= between the [hard] palate and the tip) '[t͡ɕ̻, d͡ʑ̻]'
[ʦ̻̂, ʣ̻̂][43] apicopalatal rounded (with lip rounding) '[t͡ɕ̻ʷ, d͡ʑ̻ʷ]'
[ʧ, ʤ][44] postalveo-palatal: (lamino-)… (between the postalveolar area and the lamina, with raising of the mediodorsum, and with a *lowered* tip) '[t͡ʃʲ, d͡ʒʲ]'
[ʧ, ʤ][45] postalveo-palatal protruded: (lamino-)… (with protr., not just round.) '[t͡ʃʷ, d͡ʒʷ]'
[ʧ̹, ʤ̹][46] postalveo-palatal over-rounded: (lamino-)… (with round. and protr.) '[t͡ʃʷ̹, d͡ʒʷ̹]'

[[ʧ, ʤ]][47] [ʧ, ʤ] postalveo-palatal: (lamino-)… (between the postalveolar area and the lamina, with raising of the mediodorsum, and with *raised* tip) '[t͡ʃʲ, d͡ʒʲ]'

[[ʧ, ʤ]][48] [ʧ, ʤ] postalveo-palatal protruded: (lamino-)… '[t͡ʃʷ, d͡ʒʷ]'

[[ʧ, ʤ]][49] [ʧ, ʤ] postalveo-palatal over-rounded: (lamino-)… '[t͡ʃ̹ʷ, d͡ʒ̹ʷ]'

[ʧ, ʤ][50] postalveo-prevelar: (lamino-)… (with raising of the dorsum towards the prevelum, not towards the palate) '[t͡ʃ˖ˠ, d͡ʒ˖ˠ]'

[ʧ, ʤ][51] postalveo-prevelar protruded: (lamino-)… '[t͡ʃ˖ˠʷ, d͡ʒ˖ˠʷ]'

[ʧ, ʤ][52] postalveo-prevelar over-rounded: (lamino-)… '[t͡ʃ˖̹ˠʷ, d͡ʒ˖̹ˠʷ]'

[ʧ, ʤ][53] postalveo-velar: (lamino-)… (with raising of the dorsum towards vel.) '[t͡ʃˠ, d͡ʒˠ]'

[ʧ, ʤ][54] postalveo-velar protruded: (lamino-)…'[t͡ʃˠʷ, d͡ʒˠʷ]'

[ʧ, ʤ][55] postalveo-velar over-rounded: (lamino-)… '[t͡ʃ̹ˠʷ, d͡ʒ̹ˠʷ]'

[ʧ, ʤ][56] labiodentalized postalveo-velar: (lamino-)… '[t͡ʃˠᵛ, d͡ʒˠᵛ]'

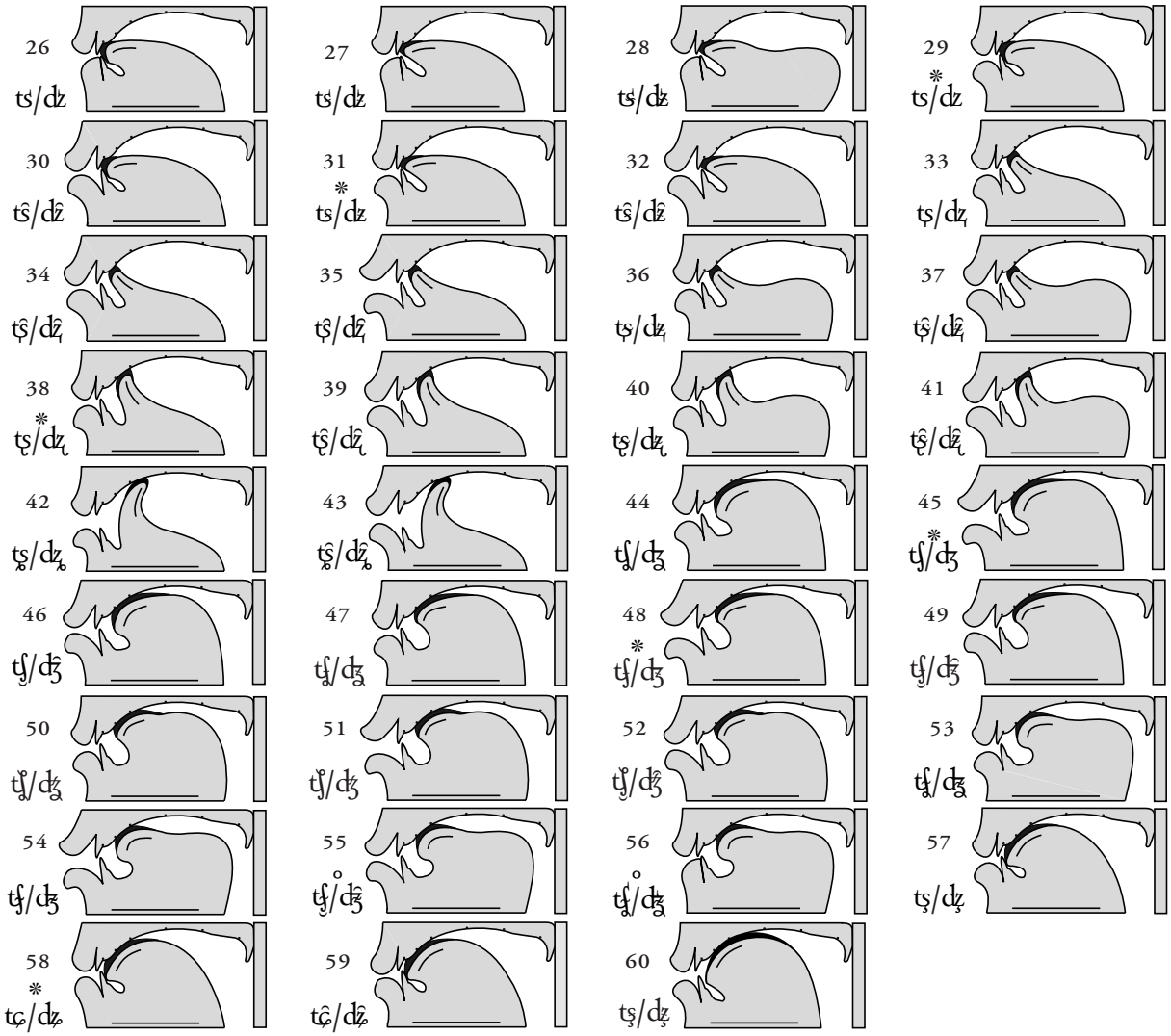
[ʦ, ʣ][57] pre-palatal: (lamino-)… (= between the prepalate and the lamina) '[t͡sʲ, d͡zʲ]'

[ʨ, ʥ][58] bilabialized pre-palatal: (lamino-)… (with vertical labialization) '[t͡sʲβ, d͡zʲβ]'

[ʨ, ʥ][59] pre-palatal rounded: (lamino-)… '[t͡sʲʷ, d͡zʲʷ]'.

[ʦ, ʣ][60] pro-palatal (= between prepalatal and palatal) '[t͡sʲ, d͡zʲ]' (≠)

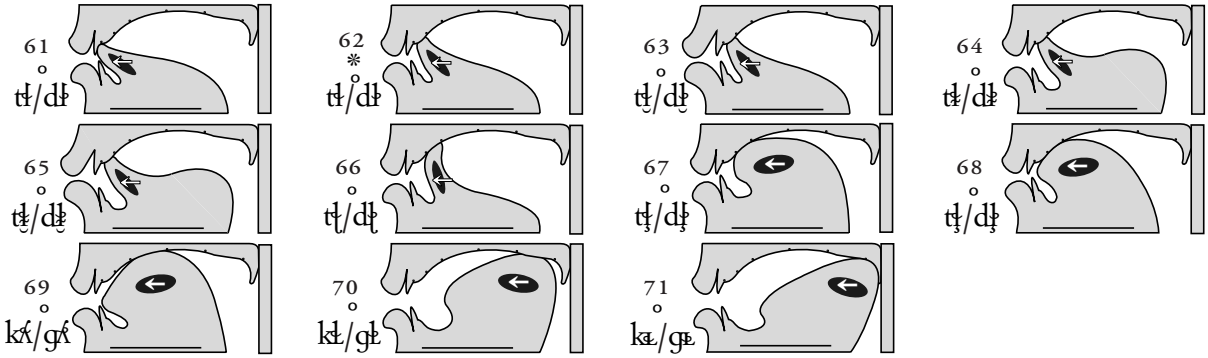
fig 10.4.2. Grooved stop-strictive orograms (34).



10.4.3. *Lateral* stopstrictives [KɬL] (11).

[[tɬ, dɮ]][61] [tɬ, dɮ] dental (with lateral contraction of the tongue) '[t͡ɬ̪, d͡ɮ̪]'
[tɬ, dɮ][62] alveolar (with lateral contraction) '[t͡ɬˢʲ, d͡ɮˢʲ]'
[tɬ̫, dɮ̫][63] alveolar rounded (with lateral contraction) '[t͡ɬˢʲ̫, d͡ɮˢʲ̫ʷ]'
[tɬˠ, dɮˠ][64] velarized alveolar (with lateral contraction) '[t͡ɬˠ, d͡ɮˠ]'
[tɬ̫ˠ, dɮ̫ˠ][65] velarized alveolar rounded (with lateral contraction) '[t͡ɬˠʷ, d͡ɮˠʷ]'
[tɬ̠, dɮ̠][66] postalveolar (with lateral contraction) '[t͡ɬ̠, d͡ɮ̠]'
[[tɬʲ, dɮʲ]][67] [tɬʲ, dɮʲ] postalveo-palatal (with lateral contraction) '[t͡ɬʲ, d͡ɮʲ]'
[tɬʲ, dɮʲ][68] prepalatal (with lateral contraction) '[t͡ɬʲ, d͡ɮʲ]'
[kʎ, gʎ][69] palatal (with lateral contraction) '[c͡ʎ̥˔, ɟ͡ʎ˔]'
[kɬ, gɬ][70] velar (with lateral contraction) '[k͡ʟ̥˔, g͡ʟ˔]'
[kꞎ, gꞎ][71] uvular (with lateral contraction) '[k͡ʟ̥˔, g͡ʟ˔]'.

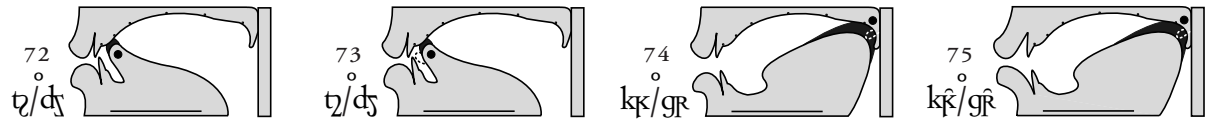
fig 10.4.3. Lateral stop-strictive orograms (11).



10.4.4. *Tapped* and *trilled* stopstrictives [KɌ] (4).

[tɽ, dɭ][72] *tapped* alveolar '[t͡ɾ̥˔, d͡ɾ˔]'
[tɽ, dɭ][73] *trilled* alveolar '[t͡r̥˔, d͡r˔]'
[kʟ, gʀ][74] *trilled* uvular '[q͡ʀ̥˔ˤ, ɢ͡ʀ˔ˤ]'
[kʡ̂, gʡ̂][75] *trilled* uvular rounded '[q͡ʀ̥˔ˤʷ, ɢ͡ʀ˔ˤʷ]'.

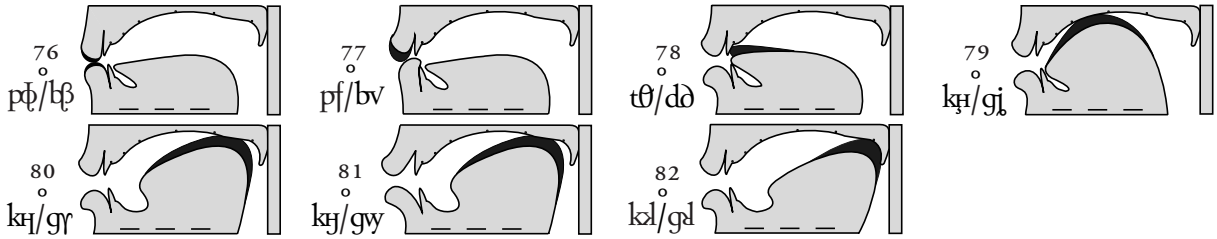
fig 10.4.4. Tap & trill stop-strictive orograms (4).



10.4.5. Stop-*semi*(con)strictives [K^{X}] (7, others are possible).

[[pɸ, bβ]][76] [pɸ, bβ] bilabial (= with semi-constrictive second element) '[p͡ɸ̞, b͡β̞]'
[[pf, bv]][77] [pf, bv] labiodental (= with semi-constrictive second element) '[p͡f̞, b͡v̞]'
[[tθ, dð]][78] [tθ, dð] dental (= with semi-constrictive second element) '[t͡θ̞, d͡ð̞]'
[[kɧ, gʝ]][79] [kç, gʝ] palatal (= with semi-constrictive second element) '[c͡ç̞, ɟ͡ʝ̞]'
[[kɧ, gɣ]][80] [kx, gɣ] velar (= with semi-constrictive second element) '[k͡x̞, g͡ɣ̞]'
[[kɧ, gw]][81] [kχ, gʁ] velar rounded (= with semi-constrictive second element) '[k͡x̞ʷ, g͡ɣ̞ʷ]'
[[kɻ, gʁ]][82] [kχ, gʁ] uvular (= with semi-constrictive second element) '[k͡χ̞, g͡ʁ̞]'.

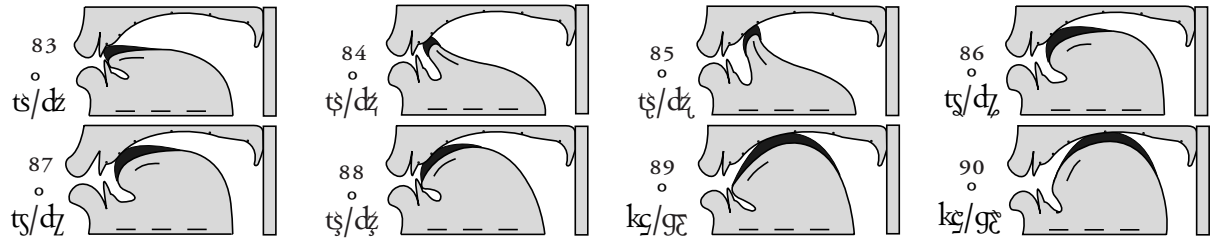
fig 10.4.5. Stop-semi-(con)strictive orograms (7).



10.4.6. *Grooved* stop-*semi*(con)strictives [K^{S}] (8, others are possible). Of course, their groove is less marked than for normal phones, and thus possible even for palatal and postpalatal phones.

⟦ts, dz⟧[83]	[ts, dz] dental (= with semi-constrictive second element) '[t͡s̪, d͡z̪]'
⟦tʂ, dʐ⟧[84]	[tʂ, dʐ] alveolar (= with semi-constrictive second element) '[t͡sˠ, d͡zˠ]'
⟦tɕ, dʑ⟧[85]	[tɕ, dʑ] postalveolar (= with semi-constrictive second element) '[t͡sʲ, d͡zʲ]'
⟦tʃ, dʒ⟧[86]	[tʃ, dʒ] postalveo-palatal (= with semi-constrictive second element) '[t͡ʃʲ, d͡ʒʲ]'
⟦tʃ, dʒ⟧[87]	[tʃ, dʒ] postalveo-palatal protruded (= with semi-constr. second el.) '[t͡ʃʷ, d͡ʒʷ]'
⟦tʂ, dʑ⟧[88]	[tʂ, dʑ] prepalatal (= with semi-constrictive second element) '[t͡sʲ, d͡zʲ]'
[kʃ, gʓ][89]	palatal (almost [kç, gʝ] but with grooved & semi-constr. second el.) '[k͡çˢ, g͡ʒᶻ]'
⟦kʃ, gʓ⟧[90]	postpalatal (almost [kç, gʝ] but with grooved & semi-constr. second el.) '[k͡çˢ, g͡ʒᶻ]'.

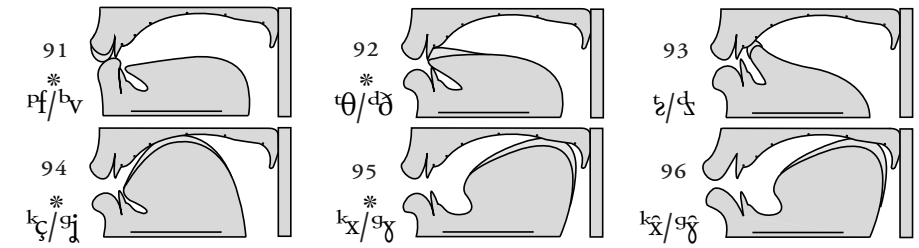
fig 10.4.6. Grooved stop-semi-(con)strictive orograms (8).



10.4.7. *Semi*stop-strictives by proportion [^{K}X] (6, others are possible).

⟦ᵖf, ᵇv⟧[91]	[pf, bv] labiodental (= with reduced first element) '[p̆f, b̆v]'
⟦ᵗθ, ᵈð⟧[92]	[tθ, dð] dental (= with reduced first element) '[t̆θ, d̆ð]'
⟦ʦ, ʤ⟧[93]	[ts, dz] alveolar (= with reduced first element) '[t̆s̪, d̆z̪]'
⟦ᵏç, ᵍʝ⟧[94]	[kç, gʝ] palatal (= with reduced first element) '[c̆ç, ɟ̆ʝ]'
⟦ᵏx, ᵍɣ⟧[95]	[kx, gɣ] velar (= with reduced first element) '[k̆x, ğɣ]'
⟦ᵏχ, ᵍʁ⟧[96]	[kχ, gʁ] velar rounded (= with reduced first element) '[k̆xʷ, ğɣʷ]'.

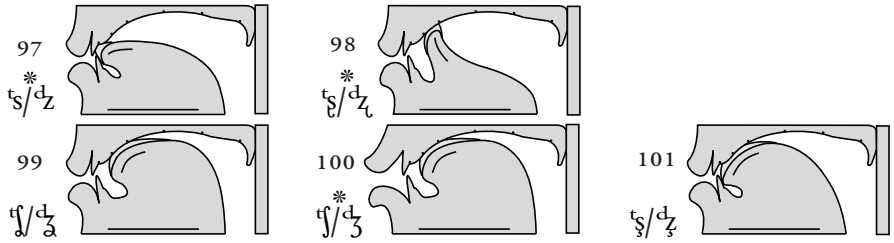
fig 10.4.7. *Semi*-stop-strictives *by proportion* (6).



10.4.8. *Grooved semi*-stop-strictives by proportion [KS] (5).

⟦ᵗs, ᵈz⟧[97] [ts, dz] dental (= with reduced first element) '[t͡s̪, d͡z̪]'
⟦ᵗʂ, ᵈʐ⟧[98] [tʂ, dʐ] postalveolar (= with reduced first element) '[t͡ʂ, d͡ʐ]'
⟦ᵗʃ, ᵈʒ⟧[99] [tʃ, dʒ] postalveo-palatal (= with reduced first element) '[t͡ʃ̪ʲ, d͡ʒ̪ʲ]'
⟦ᵗʃ, ᵈʒ⟧[100] [tʃ, dʒ] postalveo-palatal protruded (= with reduced first element) '[t͡ʃ̪ʷ, d͡ʒ̪ʷ]'
⟦ᵗʂ, ᵈʐ⟧[101] [tʂ, dʐ] prepalatal (= with reduced first element) '[t͡ʂʲ, d͡ʐʲ]'.

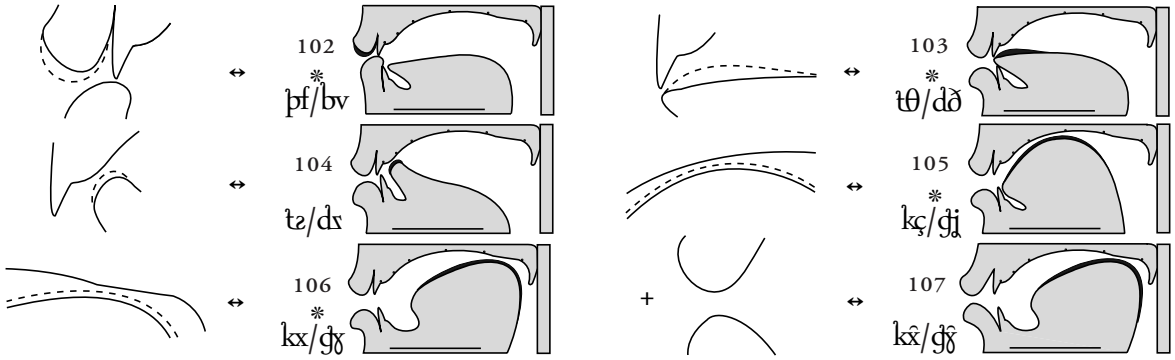
fig 10.4.8. *Grooved semi*-stop-constrictives *by proportion* (5).



10.4.9. *Semi*stop-strictives by detension [KX] (6, others are possible).

⟦ƥf, ɓv⟧[102] [pf, bv] labiodental (= with semistopped first element) '[p̪f, b̪v]'
⟦ŧθ, ɗð⟧[103] [tθ, dð] dental (= with semistopped first element) '[t̪θ, d̪ð]'
⟦ŧɾ, ɗɾ⟧[104] [tɾ, dɾ] alveolar (= with semistopped first element) '[t̪ɾ̪, d̪ɾ̪]'
⟦ƙç, ɠʝ⟧[105] [kç, gʝ] palatal (= with semistopped first element) '[c̪ç, ɟ̪ʝ̪]'
⟦ƙx, ɠɣ⟧[106] [kx, gɣ] velar (= with semistopped first element) '[k̪x, g̪ɣ]'
⟦ƙχ, ɠʁ⟧[107] [kχ, gʁ] velar rounded (= with semistopped first element) '[k̪xʷ, g̪ɣʷ]'.

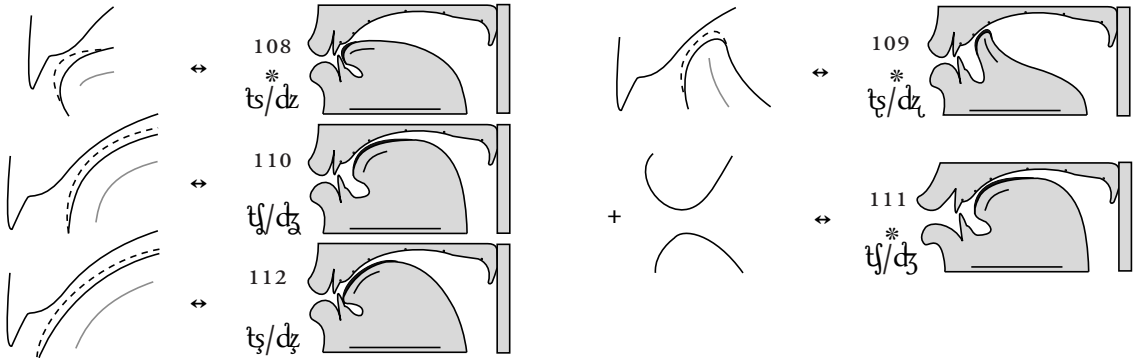
fig 10.4.9. *Semi*-stop-constrictives *by detension* (6).



10.4.10. *Grooved semi*stop-strictives by detension [KS] (5, others are possible).

⟦ŧs, ɗz⟧[108] [ts, dz] dental (= with semistopped first element) '[t̪s̪, d̪z̪]'
⟦ŧʂ, ɗʐ⟧[109] [tʂ, dʐ] postalveolar (= with semistopped first element) '[t̪ʂ, d̪ʐ]'
⟦ŧʃ, ɗʒ⟧[110] [tʃ, dʒ] postalveo-palatal (= with semistopped first element) '[t̪ʃ̪ʲ, d̪ʒ̪ʲ]'
⟦ŧʃ, ɗʒ⟧[111] [tʃ, dʒ] postalveo-palatal protruded (= with semistopped first element) '[t̪ʃ̪ʷ, d̪ʒ̪ʷ]'
⟦ŧʂ, ɗʐ⟧[112] [tʂ, dʐ] prepalatal (= with semistopped first element) '[t̪ʂʲ, d̪ʐʲ]'.

fig 10.4.10. *Grooved semi*-stop-strictives *by detension* (5).



Constrictives /Σ/ [X, Ⱨ, S, ˣ, ˢ] (still called 'fricatives' – 122)

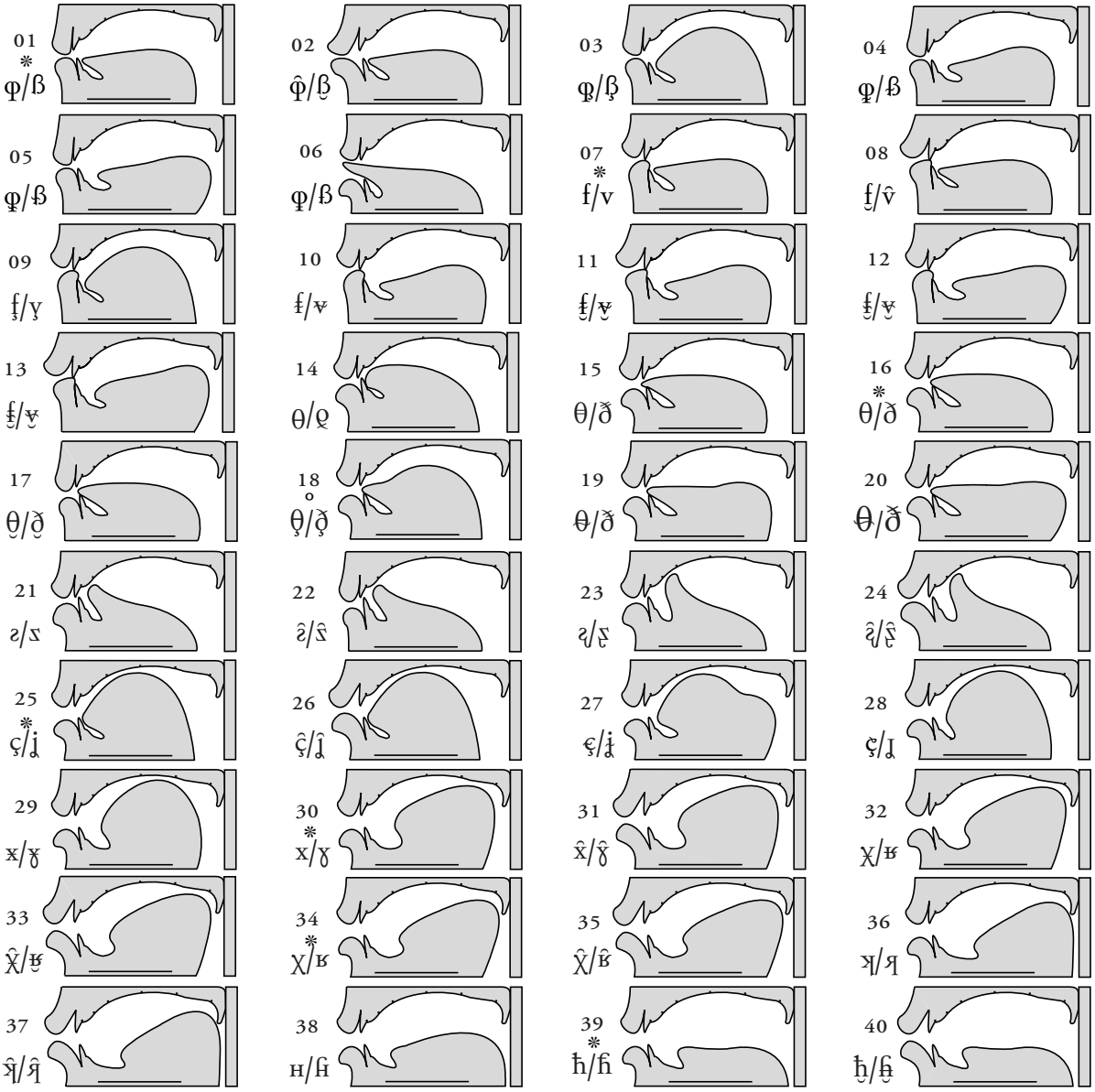
10.5. These comprise five synopses of plain (or 'slit', or un-grooved) and grooved phones. Again, *grooved* refers to the actual groove which can be formed on the tip and lamina of the tongue. Also the possible laryngeal constrictives are shown; semi-constrictives are given, as well (including grooved ones). Instead, the synopses of lateral and trilled constrictives are placed among the corresponding manners, since that is their prevailing aspect.

10.5.1. Constrictives [X] (40).

[ɸ, ß]01 bilabial (= between the lips) '[ɸ, β]' (≠)
[ɸ̂, β̂]02 bilabial rounded (= bilabial with lip rounding) '[ɸʷ, βʷ]'
[ɸ̟, β̟]03 palatalized bilabial '[ɸʲ, βʲ]'
[ɸ̠, β̠]04 velarized bilabial '[ɸˠ, βˠ]'
⟦ɸ, ß⟧05 [ɸ, ß] uvularized bilabial '[ɸ̝, β̝]'
[ɸ, ß]06 labial-apical (= between the upper lip and the tip of the tongue) '[s̪, z̪]'
[f, v]07 labiodental (= between the lower lip and the upper teeth) '[f, v]' (=)
[f̂, v̂]08 labiodental rounded '[fʷ, vʷ]'
[f̟, v̟]09 palatalized labiodental '[fʲ, vʲ]'
[f̠, v̠]10 velarized labiodental '[fˠ, vˠ]'
[f̠̂, v̠̂]11 velarized labiodental rounded '[fˠʷ, vˠʷ]'
⟦f̠, v̠⟧12 [f̠, v̠] uvularized labiodental '[f̝, v̝]'
⟦f̠̂, v̠̂⟧13 [f̠̂, v̠̂] uvularized labiodental rounded '[f̝ʷ, v̝ʷ]'
⟦θ, ǫ⟧14 [θ, ð] dental or pre-dental (with a *lowered* tip), or predorsal-dental '[θ̻, ð̻]'
⟦θ, ð⟧15 [θ, ð] pro--dental (with a *raised* and protruding tip), or interdental '[θ̪, ð̪]'
[θ, ð]16 dental (with a *raised* tip) '[θ, ð]' (=)
[θ̂, ð̂]17 dental rounded (with a *raised* tip) '[θʷ, ðʷ]'
⟦θ̟, ð̟⟧18 ([θj, ðj]) palatalized dental (with a *lowered* or *raised* tip) '[θʲ, ðʲ]'
[θ̠, ð̠]19 velarized dental (with a *raised* tip) '[θˠ, ðˠ]'
⟦θ̠, ð̠⟧20 [θ̠, ð̠] uvularized dental (with a *raised* tip) '[θ̝, ð̝]'
[ɹ, ɻ]21 alveolar '[ɹ̪, ɻ̪]'
[ɹ̂, ɻ̂]22 alveolar rounded '[ɹ̪ʷ, ɻ̪ʷ]'
[ɹ̟, ɻ̟]23 postalveolar: (apico-)… (not lam.) '[ɹ̺, ɻ̺]'
[ɹ̟̂, ɻ̟̂]24 postalveolar rounded: (apico-)… (not lam.) '[ɹ̺ʷ, ɻ̺ʷ]'
[ç, ʝ]25 palatal '[ç, ʝ]' (=, ≠)
[ç̂, ʝ̂]26 palatal rounded '[çʷ, ʝʷ]'
⟦ɕ, ʑ⟧27 [ɕ, ʑ] uvularized palatal '[ç̝, ʝ̝]'
⟦ɕ, ʝ⟧28 [ç, ʝ] postpalatal (= retracted palatal or advanced prevelar) '[ç̄, ʝ̄]'
⟦x, ɣ⟧29 [x, ɣ] prevelar '[x̟, ɣ̟]'
[x, ɣ]30 velar '[x, ɣ]' (=, ≡)
[x̂, ɣ̂]31 velar rounded (or [x̘, ɣ̘], cf § 9.14) '[xʷ, ɣʷ]'
⟦χ, ʁ⟧32 [χ, ʁ] preuvular '[χ̟, ʁ̟]'
⟦χ̂, ʁ̂⟧33 [χ, ʁ] preuvular rounded '[χ̟ʷ, ʁ̟ʷ]'
[χ, ʁ]34 uvular '[χ, ʁ]' (=)
[χ̂, ʁ̂]35 uvular rounded '[χʷ, ʁʷ]'
[ʞ, ʁ̞]36 pharyngealized uvular '[χˤ, ʁˤ]'

[ʢ̂, ʡ̂][37] pharyngealized uvular rounded '[χˢʢʷ, ʁˢʢʷ]'
[ʜ, ʡ̈][38] prepharyngeal (= between the *upper* pharynx and root of the tongue) '[ħ, ʕ]' (≠)
[ħ, ʡ̈][39] pharyngeal (= betw. the *lower* phar. and the root of the t., 'epiglottal') '[ʜ, ʢ]' (≠)
[ḫ, ʡ̰][40] pharyngeal rounded ('epiglottal' rounded) '[ʜʷ, ʕʷ]'.

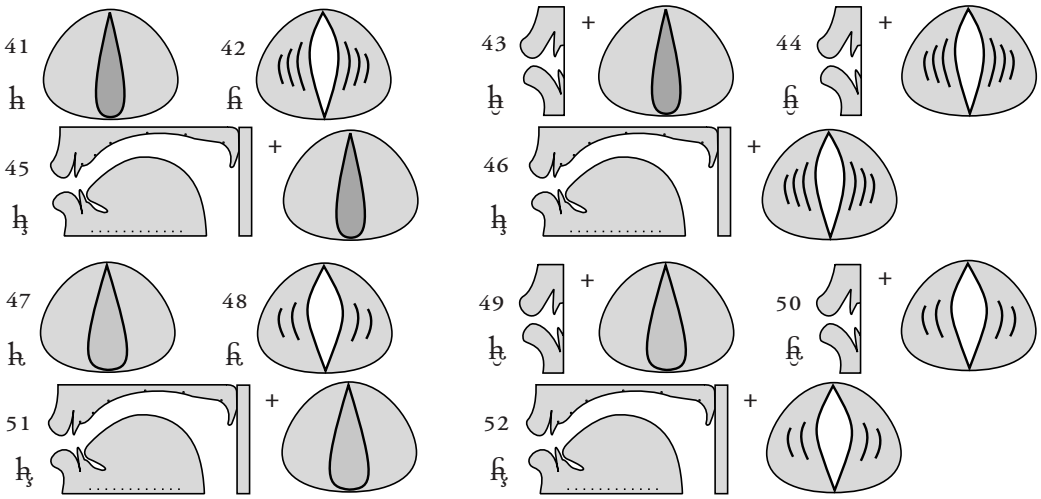
ƒig 10.5.1. Constrictive orograms (40).



10.5.2. *Laryngeal* constrictives [Ḥ] & semi-constrictives [ᴴ] (or 'glottal', (in International English pronunciation: [ləˈɹɪŋʤɨ̞, læ-, -ʤiɨ̞, ˌlæɹəŋˈʤiiɨ̞], or *laryngal* [ləˈɹɪŋgɨ̞, læ-], 12 – ƈf § 10.13, too).

[[h̶, ɦ̶]][41-42] [h, ɦ] laryngeal (= between vocal folds, including aryten. cartil.) '[h, ɦ]'
[[ḫ̶, ɦ̶̰]][43-44] [h, ɦ] laryngeal rounded (with lip rounding) '[hʷ, ɦʷ]'
[[ẖ̶, ɦ̶̱]][45-46] [h, ɦ] palatalized laryngeal '[hʲ, ɦʲ]'
[[h̶̰, ɦ̶̰]][47-48] [h, ɦ] laryngeal (*semiconstrictive*, with less energy and expirat. air) '[h̰, ɦ̰]'
[[ḫ̶̰, ɦ̶̰]][49-50] [h, ɦ] laryngeal rounded (*semiconstrictive*) '[h̰ʷ, ɦ̰ʷ]'.
[[ẖ̶̰, ɦ̶̱̰]][51-52] [h, ɦ] palatalized laryngeal (*semiconstrictive*) '[h̰ʲ, ɦ̰ʲ]'

fig 10.5.2. Constrictive (41-46) and semi-constrictive (47-52) laryngograms (12).

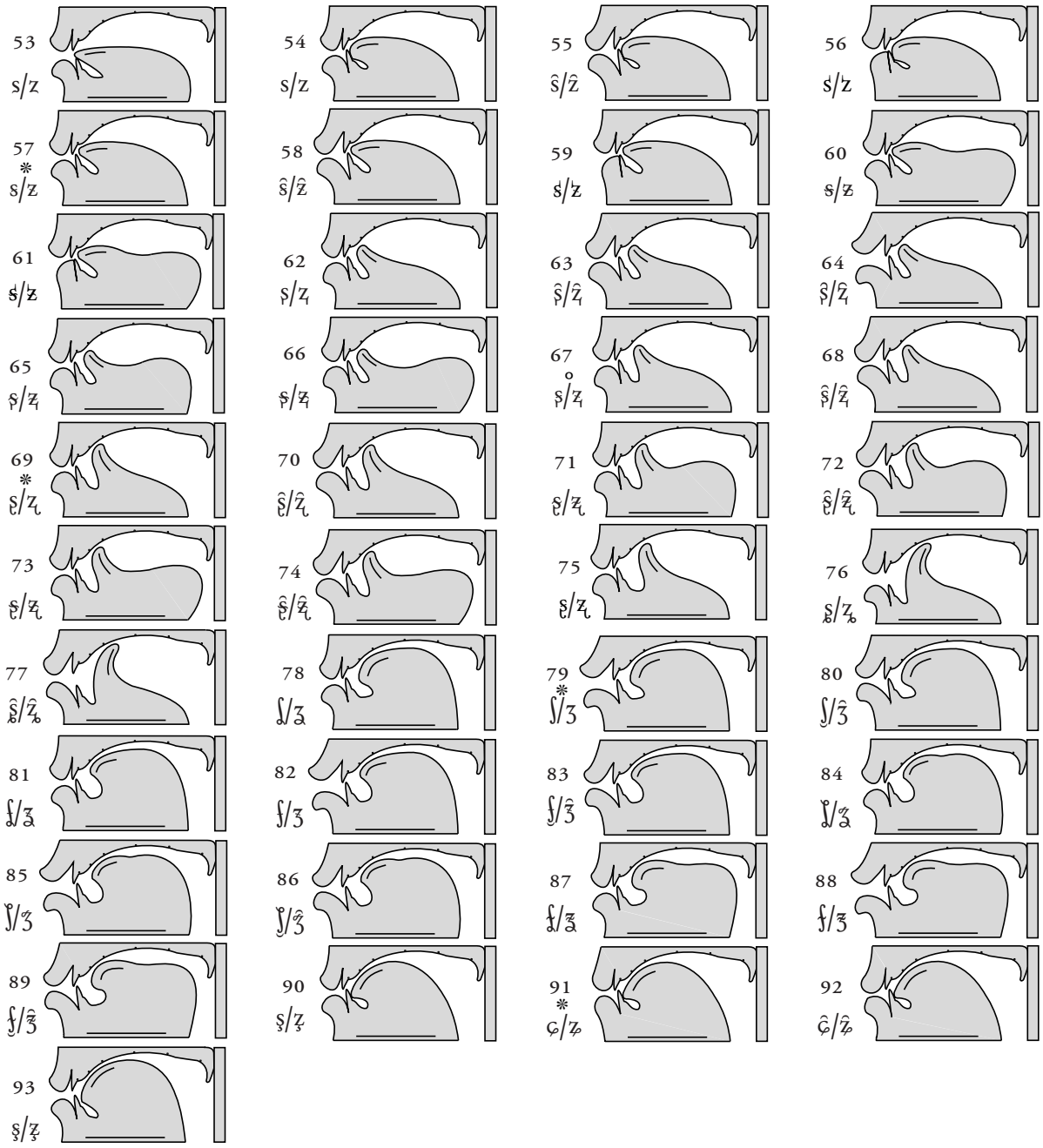


10.5.3. *Grooved* constrictives [S] (41).

[s, z][53] prodental '[s̪, z̪]'
[s, z][54] dental (with a *lowered* tip) '[s̻, z̻]'
[ŝ, ẑ][55] dental rounded (with a *lowered* tip) '[s̻ʷ, z̻ʷ]'
[s, z][56] labiodentalized dental (with a *lowered* tip) '[sᵛ, zᵛ]'
[[s, z]][57] [s, z] denti-alveolar (with a *raised* tip) '[s̺, z̺]'
[[ŝ, ẑ]][58] [ŝ, ẑ] denti-alveolar rounded (with a *raised* tip) '[s̺ʷ, z̺ʷ]'
[[s, z]][59] [s, z] labiodentalized denti-alveolar (with a *raised* tip) '[s̺ᵛ, z̺ᵛ]'
[[s, z]][60] [s, z] uvularized dental, or denti-alv. (with a *raised* tip, or more rarely *lowered*) '[s̺ˠ, z̺ˠ]'
[[s, z]][61] [s, z] labiodento-uvularized dental (with a *raised* tip), or …denti-alveolar '[s̺ˠᵛ, z̺ˠᵛ]'
[s, z][62] alveolar: (apico-) '[s̺, z̺]'ꞩz
[ŝ, ẑ][63] alveolar rounded: (apico-)… '[[s̺ʷ, z̺ʷ]'
[[ŝ, ẑ]][64] [ŝ, ẑ] alveolar protruded: (apico-)… '[[s̺₊, z̺ʷ₊]'
[s, z][65] velarized alveolar: (apico-)… '[s̺ˠ, z̺ˠ]'
[[s, z]][66] [s, z] uvularized alveolar: (apico-)… '[s̺ˠ, z̺ˠ]'
[[s, z]][67] back-alveolar (apico-)… '[s̄, z̄]' or '[s̪̄, z̪̄]'
[[ŝ, ẑ]][68] back-alveolar rounded (apico-)… '[s̄, z̄]' or '[s̪̄, z̪̄]'
[s, z][69] postalveolar: (apico-)… (not laminal) '[s̠, z̠]' (=)
[ŝ, ẑ][70] postalveolar rounded: (apico-)… '[s̠ʷ, z̠ʷ]'
[s, z][71] velarized postalveolar: (apico-)… '[s̠ˠ, z̠ˠ]'
[ŝ, ẑ][72] velarized postalveolar rounded: (apico-)… '[s̠ˠʷ, z̠ˠʷ]'
[[s, z]][73] [s, z] uvularized postalveolar : (apico-)… '[s̠ˠʷ, z̠ˠʷ]'
[[ŝ, ẑ]][74] [ŝ, ẑ] uvularized postalveolar rounded: (apico-)… '[s̠ˠʷ, z̠ˠʷ]'
[s, z][75] back-postalveolar: (apico-)… (not laminal) '[s̠̄, z̠̄]'
[s, z][76] apico-palatal (= between the palate and the tip) '[s̠̄, z̠̄]'
[ŝ, ẑ][77] apico-palatal rounded '[s̠̄ʷ, z̠̄ʷ]'
[ʃ, ʒ][78] postalveo-palatal: (lamino-)… (with a *lowered* tip) '[ʃ̻ʲ, ʒ̻ʲ]'
[ʃ, ʒ][79] postalveo-palatal protruded: (lamino-)… '[ʃ̻ʷ, ʒ̻ʷ]'
[ʃ, ʒ][80] postalveo-palatal over-rounded: (lamino-)… '[ʃ̻ʷ, ʒ̻ʷ]'
[[ʃ, ʒ]][81] [ʃ, ʒ] postalveo-palatal: (lamino-)… (with *raised* tip) '[ʃ̺ʲ, ʒ̺ʲ]'
[[ʃ, ʒ]][82] [ʃ, ʒ] postalveo-palatal protruded '[ʃ̺ʷ, ʒ̺ʷ]'

[[ʃ̻, ʒ̻]][83] [ʃ̻, ʒ̻] postalveo-palatal over-rounded: (lamino-)… '[ʃ̻ʷ, ʒ̻ʷ]'
[ʃ̠, ʒ̠][84] postalveo-prevelar: (lamino-)… '[ʃ̻˖˕, ʒ̻˖˕]'
[ʃ̠, ʒ̠][85] postalveo-prevelar: (lamino-)… '[ʃ̻˖˕ʷ, ʒ̻˖˕ʷ]'
[ʃ̠, ʒ̠][86] postalveo-prevelar over-rounded: (lamino-)… '[ʃ̻˖˕ʷ, ʒ̻˖˕ʷ]'
[ʃ̲, ʒ̲][87] postalveo-velar: (lamino-)… '[ʃ̻˕, ʒ̻˕]'
[ʃ̲, ʒ̲][88] postalveo-velar protruded: (lamino-)… '[ʃ̻˕ʷ, ʒ̻˕ʷ]'
[ʃ̲, ʒ̲][89] postalveo-velar over-rounded '[ʃ̻˕ʷ, ʒ̻˕ʷ]'
[ʂ, ʐ][90] pre-palatal: (lamino-)… '[ʂʲ, ʐʲ]'
[ɕ, ʑ][91] bilabialized pre-palatal: (lamino-… with *vertical* labialization)… '[ʂʲβ, ʐʲβ]'
[ɕ̂, ʑ̂][92] pre-palatal rounded: (lamino-)… '[ʂʲʷ, ʐʲʷ]'
[ʂ, ʐ][93] pro-palatal (= between prepalatal and palatal) '[ʂʲ, ʐʲ]' (≠).

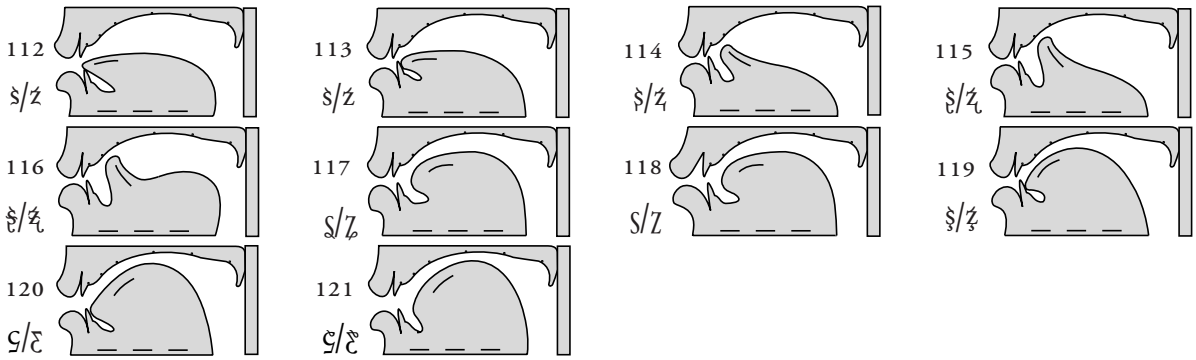
fig 10.5.3. Grooved constrictive orograms (41).



10.5.4. Semi-constrictives [X] (18).

⟦ɸ, β⟧[93] [ɸ, ß] bilabial (= intermediate between constrictive and approximant) '[ɸ̞, β̞]'
⟦f, v⟧[94] [f, v] labiodental (= intermediate between constrictive and approximant) '[f̞, v̞]'
⟦/, ⱱ̟⟧[95] [ⱱ] labialized labiodental (= intermediate between constrictive and approx.) '[ⱱ̞ʷ]'
⟦f, ⱱ̟⟧[96] [f, v] palatalized labiodental (= intermediate between constr. and approx.) '[f̞ʲ, ⱱ̞ʲ]'
⟦θ, ð⟧[97] [θ, ð] dental (= intermediate between constrictive and approximant) '[θ̞, ð̞]'
⟦ɾ̠, ɹ̠⟧[98] alveolar (= intermediate between constrictive and approximant) '[ɾ̞, ɹ̞]'
⟦ʜ, ʝ̟⟧[99] [ç, ʝ] palatal (= intermediate between constrictive and approximant) '[ç̞, ʝ̞]'
[/, ʎ̝][100] lateralized palatal (with slight friction noise) '[ʎ̝̞]'
⟦ʜ̟, ʝ̟⟧[101] [ç, ʝ] postpalatal (= intermediate between constrictive and approximant) '[ç̞, ʝ̞]'
⟦/, ɥ̟⟧[102] palatal rounded (= intermediate between constrictive and approximant) '[ʝ̞ʷ]'
⟦/, ɥ̠⟧[103] pospalatal rounded (= intermediate between constrictive and approximant) '[ʝ̞ʷ]'
⟦ɧ, ɣ̟⟧[104] [x, ɣ] prevelar (= intermediate between constrictive and approximant) '[x̟̞, ɣ̟̞]'
⟦ɧ, ɣ⟧[105] [x, ɣ] velar (= intermediate between constrictive and approximant) '[x̞, ɣ̞]'
⟦ɧ, ɯ̟⟧[106] velar rounded (= interm. between constrictive and approximant) '[x̞ʷ, ɣ̞ʷ]'
⟦ʞ, ʁ̠⟧[107] [χ, ʁ] preuvular (= intermediate between constrictive and approximant) '[χ̞, ʁ̞]'
⟦ʞ, ʁ⟧[108] [χ, ʁ] uvular (= intermediate between constrictive and approximant) '[χ̞, ʁ̞]'
⟦ʜ, /⟧[109] [ʜ] prepharyngeal (= intermediate between constrictive and approximant) '[ʜ̞]'
⟦ħ, /⟧[110] [ħ] pharyngeal (= intermediate between constrictive and approximant) '[ʜ̞]'
⟦ħ̞, /⟧[111] [ħ̞] pharyngeal rounded (= intermediate between constrictive and approx.) '[ʜ̞ʷ]'.

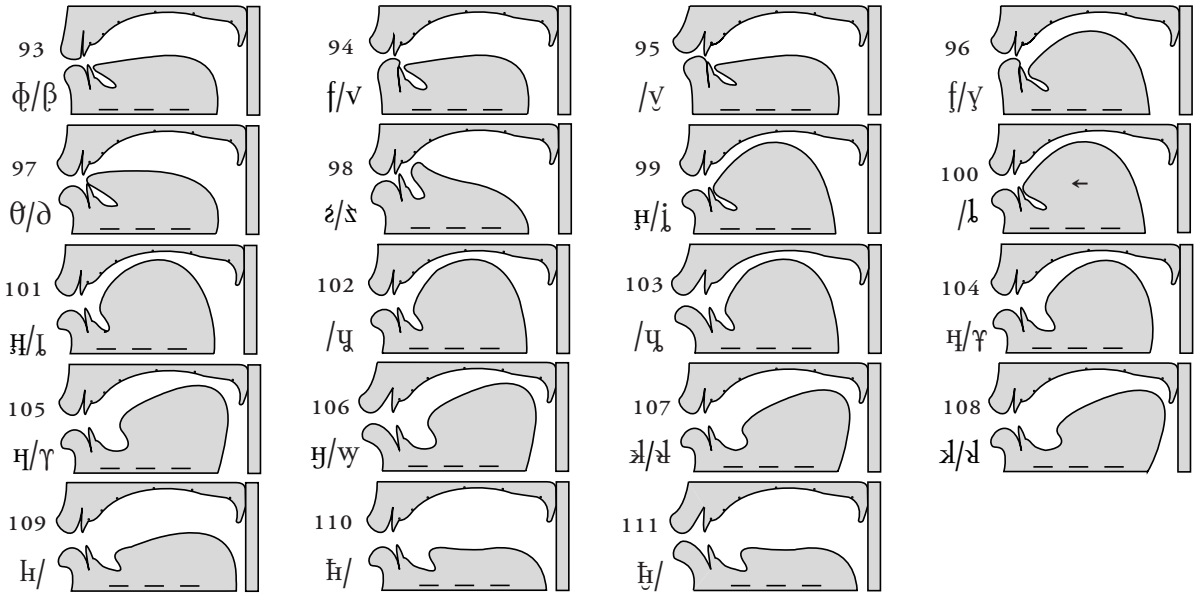
fig 10.5.5. Grooved semi-constrictive orograms (10).



10.5.5. *Grooved* semi-constrictives [S] (10).

⟦s, z⟧[112] [s, z] prodental (= intermediate between constrictive and approximant) '[s̪̞, z̪̞]'
⟦s, z⟧[113] [s, z] dental (= intermediate between constrictive and approximant) '[s̪̞, z̪̞]'
⟦ʂ, ʐ⟧[114] [ʂ, ʐ] alveolar (= intermediate between constrictive and approximant) '[ʂ̞, ʐ̞]'
⟦ʂ̠, ʐ̠⟧[115] [ʂ, ʐ] postalveolar (= intermediate between constrictive and approx.) '[ʂ̠̞ʷ, ʐ̠̞ʷ]'
⟦ʂ̠, ʐ̠⟧[116] [ʂ, ʐ] postalveolar (= intermediate between constric. and approx.) '[ʂ̠̞ʷ, ʐ̠̞ʷ]'
⟦ʃ, ʒ⟧[117] [ʃ, ʒ] postalveo-palatal: (lamino-)… (= interm. between constr. and appr.) '[ʃ̻̞ʲ, ʒ̻̞ʲ]'
⟦ʃ, ʒ⟧[118] [ʃ, ʒ] postalveo-palatal protruded: (lamino-)… (= int. betw. con. & app.) '[ʃ̻̞ʷ, ʒ̻̞ʷ]'
⟦ʂ̟, ʐ̟⟧[119] [ʂ, ʐ] prepalatal (= interm. between constrictive and approximant) '[ʂ̟̞ʲ, ʐ̟̞ʲ]'
⟦ɕ, ʑ⟧[120] palatal (almost [ç, ʝ] but grooved & interm. betw. constric. and approx.) '[ç̞ˢ, ʝ̞ᶻ]'
⟦ɕ̟, ʑ̟⟧[121] postpalatal (almost [ç, ʝ] but retracted, grooved & interm. betw. constr. and appr.) '[ç̞ˢ, ʝ̞ᶻ]'.

ƒig 10.5.4. Semi-constrictive orograms (number [100] is also lateralized – 19).



Approximants /J/ [J, ᴶ, J̃, H, ɭ, ʅ*, ᶩ] (108)

10.6. These include six synopses –in addition to those of normal phones– also those of semi-approximants, some nasalized phones (among the various possibilities), laryngeals, and lateralized ones (with structuring differences, which we will see below, as for semi-approximants or semi-… approximants).

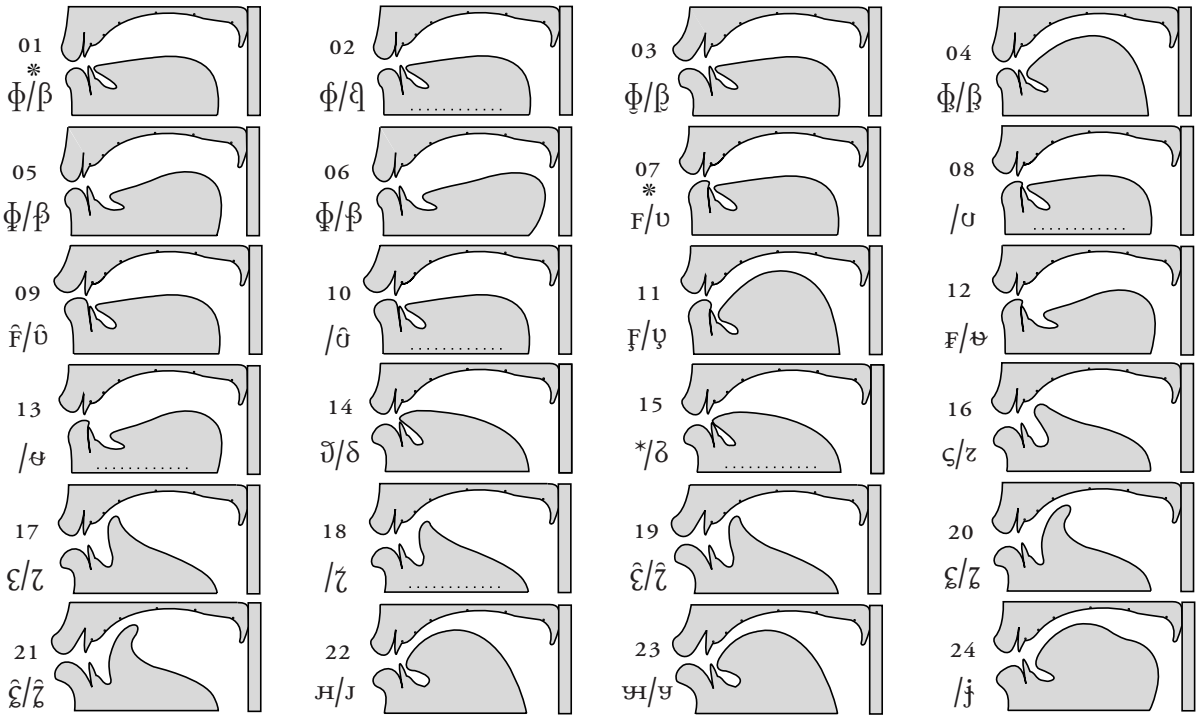
10.6.1. (Normal, rather 'static') approximants [J] (in addition to 'dynamic' ones, shown by a double arrow on their orograms, indicating a tiny, but clear, movement of the dorsum). We also indicate *semi*-approximant articulations, with greater space between the articulators than for approximants and with a definitely more elusive auditory impression [ᴶ]. We put them close to real approximants, for useful comparisons, in order to show their tiny differences better. In addition, to be of further help, the semi-approximant orograms bear a broken line on their bottom. In order to adequately show the difference between constrictives, semi--constrictives, approximants and semi-approximants, within the very poor possibilities of *offIPA* symbols and diacritics, we would be obliged to use combinations of even *four* same signs, as [ ] – for instance, in order to transcribe our semiapproximant [ɸ̞], it would be necessary to combine [β] with [ ]. Therefore, we give up fully trying to indicate the difference between all of these four classes of contoids, especially seen that too often *offIPA* does not coherently distinguish yet even between constrictives and approximants. The same is true for other nuances (such as for places of articulation) that *canIPA*, instead, can adequately show.

As a matter of fact, we are showing these official monstruosities more to insist on their absurdity, rather than to try to guide readers to their more or less (im)probable interpretation (70).

[ɸ, β]01 bilabial (= vertically) '[ ]'
⟦ɸ, ɸ̞⟧02 [β] *semi*-bilabial (= bilabial, with very wide narrowing) '[ ]'
[ɸ̞, β̞]03 bilabial rounded '[ ]'
[ɸ̞ʲ, β̞ʲ]04 palatalized bilabial '[ ]'
[ɸ̞ˠ, β̞ˠ]05 velarized bilabial '[ ]'
⟦ɸ̞, β̞⟧06 [ɸ̞, β̞] uvularized bilabial '[ ]'
[ʀ, ʊ]07 labiodental '[ ]' (≠, =)
[/, ʊ]08 *semi*-labiodental '[ ]'
[ʀ̂, ʊ̂]09 labiodental rounded '[ ]'
[/, ʊ̂]10 *semi*-labiodental rounded '[ ]'
[ʀʲ, ʋʲ]11 palatalized labiodental '[ ]'
⟦ʀ, ʁ⟧12 [ʀ, ʁ] uvularized labiodental '[ ]'
⟦/, ʁ⟧13 [ʁ] *semi*-uvularized labiodental '[ ]'
[ʊ̈, ð]14 dental, or lamino-dental (with *raised* tip) '[ ]'
⟦ʊ̈, ð⟧15 [ʊ̈, ð] *semi*-dental (= dental, with very wide narrowing) '[ ]'
[ʂ, ʐ]16 alveolar '[ ]'
[ɕ, ʑ]17 postalveolar: (apico-)… (not laminal) '[ ]'
[/, ʑ]18 *semi*-postalveolar: (apico-)… (not laminal) '[ ]'
[ɕ̂, ʑ̂]19 postalveolar rounded: (apico-)… '[ ]'
[ɕ̺, ʑ̺]20 apico-palatal '[ ]'

[ʝ̞̊, ʒ̞̊][21] apico-palatal rounded '[ʂ̞̊ʷ, ʐ̞̊ʷ]'
[ʜ, ɻ][22] prepalatal: (lamino-)… '[ʂ̻ʲ, ʐ̻ʲ]'
[ʮ, ʯ][23] prepalatal rounded: (lamino-)… '[ʂ̻ʲʷ, ʐ̻ʲʷ]'
[/, ɟ̊][24] ⟦ɟ̊⟧ uvularized palatal *dynamic* '[qˠ̟]'

fig 10.6.1. First approximant & semi-approximant orograms (24).

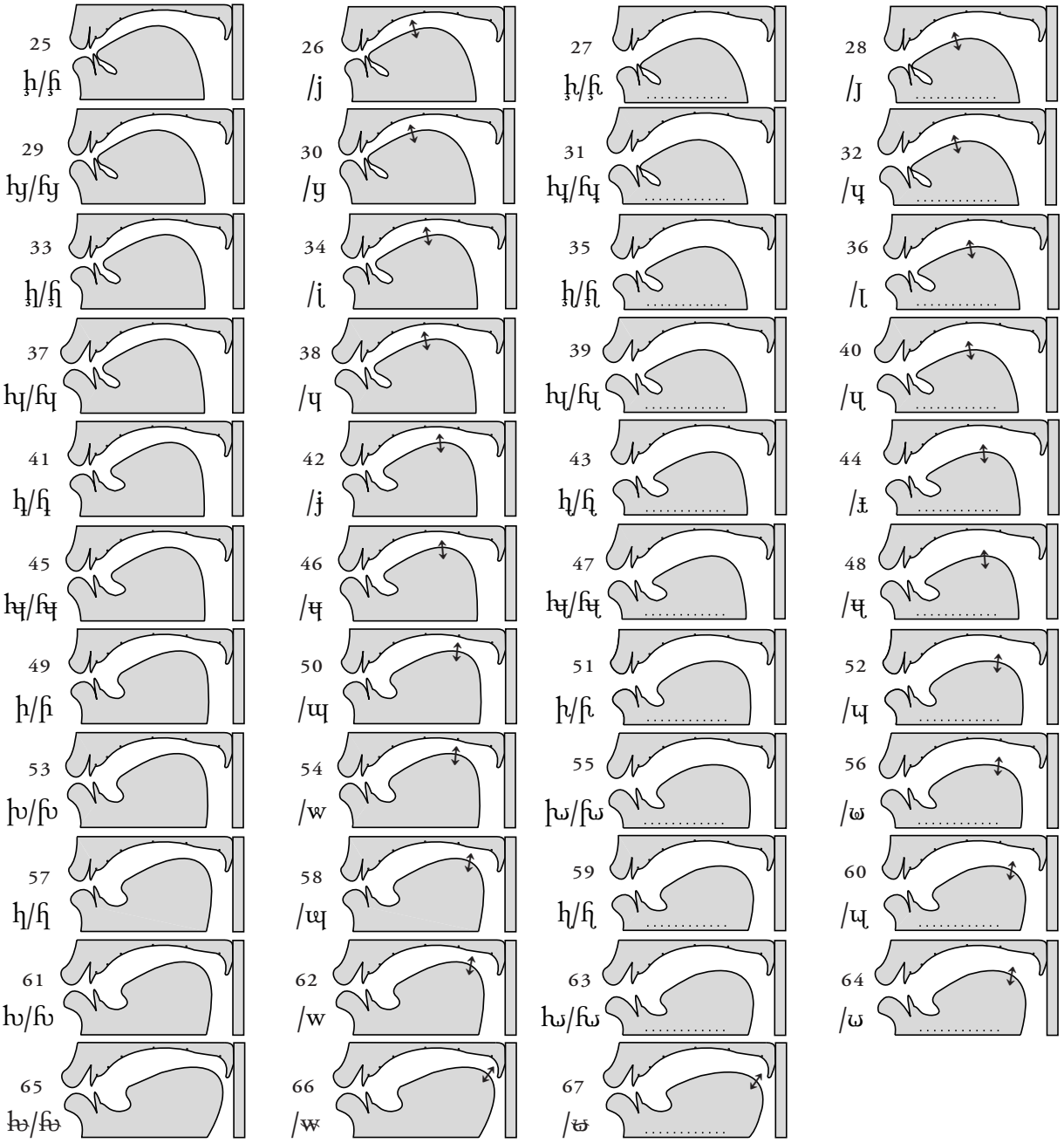


10.6.2. Dorsal approximants corresponding to some vocoids.

[ɧ, ʄ][25] palatal '[h͡j, ɦ͡j]' (≠)
[/, j][26] palatal *dynamic* '[j]' (=)
⟦ɧ, ʄ⟧[27] [j] *semi*-palatal (with very wide narrowing) '[h̬ʲ, ɦ̬ʲ]'
⟦/, ɻ⟧[28] [j] *semi*-palatal *dynamic* (with very wide narrowing) '[j̬]'
[ɥ ɥ][29] palatal rounded '[h͡ɥ, ɦ͡ɥ]' (≠)
[/, ɥ][30] palatal rounded *dynamic* '[ɥ]'
[ɥ, ʮ][31] *semi*-palatal rounded '[h͡ɥ, ɦ͡ɥ]' (≠)
[/, ɥ][32] *semi*-palatal rounded *dynamic* '[ɥ]'
[ɧ, ʃ][33] postpalatal '[h͡j̄, ɦ͡j̄]'
[/, ʲ][34] postpalatal *dynamic* '[j̄]'
[ɧ, ʃ][35] *semi*-postpalatal '[h͡j̄, ɦ͡j̄]'
[/, ʲ][36] *semi*-postpalatal *dynamic* '[j̄]'
[ɥ, ʮ][37] postpalatal rounded '[h͡ɥ̄, ɦ͡ɥ̄]'
[/, ɥ][38] postpalatal rounded *dynamic* '[ɥ̄]'
[ɥ, ʮ⟧[39] [ɥ] *semi*-postpalatal rounded (with very wide narrowing) '[h͡ɥ̄, ɦ͡ɥ̄]'
[/, ɥ⟧[40] [ɥ] *semi*-postpalatal rounded *dynamic* (with very wide narrowing) '[ɥ̬̄]'
[ɧ, ʃ][41] prevelar '[h͡j̟, ɦ͡j̟] or [h͡ɯ̟, ɦ͡ɯ̟]'
[/, ɟ][42] prevelar *dynamic* '[j̟̈] or [ɯ̟̈]'
⟦ɧ, ʃ⟧[43] [ɯ] *semi*-prevelar (with very wide narrowing) '[j̟̬] or [ɯ̟̬]'
⟦/, ɤ̞⟧[44] [ɯ] *semi*-prevelar *dynamic* (with very wide narrowing) '[j̟̬] or [ɯ̟̬]'

[ɧ, ɦ][45]	prevelar rounded ‘[h͡ʉ̟, ɦ͡ʉ̟]’
[/, ɬ][46]	prevelar rounded *dynamic* ‘[ʉ̟]’
[[ɧ, ɦ]][47]	[ɥ] *semi*-prevelar rounded (= prevel., with very wide narrowing) ‘[h͡ɥ̟, ɦ͡ɥ̟]’
[[/, ɬ]][48]	[ɥ] *semi*-prevelar rounded *dynamic* (= prevel., with very wide narrowing) ‘[ɥ̟]’
[ɧ, ɦ][49]	*pro*velar (= between prevelar and velar) ‘[h͡ʊ̞, ɦ͡ʊ̞]’
[/, ɯ][50]	*pro*velar *dynamic* (= between prevelar and velar) ‘[ʊ̞]’
[[ɧ, ɦ]][51]	[ɯ] *semi*-provelar (with very wide narrowing) ‘[h͡ʊ̞̈, ɦ͡ʊ̞̈]’
[[/, ɯ]][52]	[ɯ] *semi*-provelar *dynamic* (with very wide narrowing) ‘[ʊ̞̈]’
[ɧ, ɦ][53]	*pro*velar rounded ‘[h͡ʍ̟, ɦ͡ʍ̟]’
[/, w][54]	*pro*velar rounded *dynamic* ‘[ʍ̟]’
[[ɧ, ɦ]][55]	[ɯ] *semi*-provelar rounded (with very wide narrowing) ‘[h͡ʍ̟, ɦ͡ʍ̟]’

ƒig 10.6.2. Dorsal approximant & semi-approximant orograms (including dynamic ones – 43).

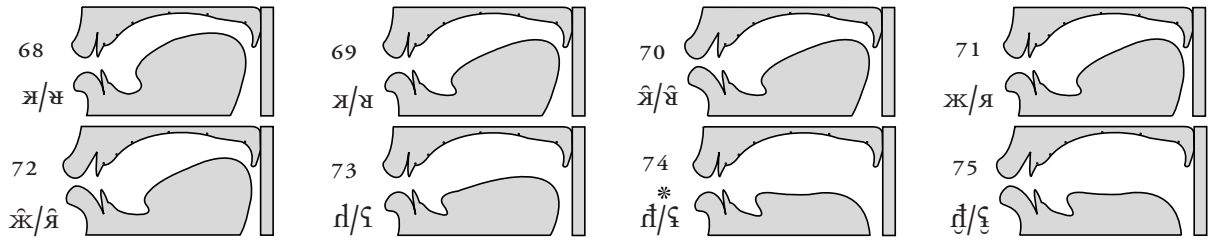


[[/, ɷ]][56] [ɯ] *semi*-provelar rounded *dynamic* (with very wide narrowing) '[ɯ̟̈]'
[ɧ, ɦ][57] velar '[h͡ɯ, ɦ͡ɯ]' (≠)
[/, ɯ][58] velar *dynamic* '[ɯ]' (≠)
[ɧ, ɦ][59] *semi*-velar '[h͡ɯ, ɦ͡ɯ]' (≠)
[/, ɥ][60] *semi*-velar *dynamic* '[ɯ]' (≠)
[ɧ, ɦ][61] velar rounded '[h͡ʍ, ɦ͡w]' (≠)
[/, w][62] velar rounded *dynamic* '[w]' (=)
[[ɧ, ɦ]][63] [w] *semi*-velar rounded (with very wide narrowing for both points) '[h͡w̆, ɦ͡w̆]'
[[/, ɷ]][64] [w] *semi*-velar rounded *dynamic* (with very wide narrowing for both points) '[w̆]'
[ɦ, ɦ][65] [[ɦ, ɦ]] uvularized velar rounded '[h͡ʍ̞̆, ɦ͡w̞̆]'
[/, ʷ][66] [[ʷ]] uvularized velar rounded *dynamic* '[w̞̆]'
[/, ɷ][67] [[ɷ]] uvularized *semi*-velar rounded *dynamic* '[w̞̆]'.

10.6.3. Back approximants.

[ʁ, ʁ][68] preuvular '[χ̟̆, ʁ̟̆]'
[ʁ, ʁ][69] uvular '[χ̞̆, ʁ̞̆]'
[ʁ̂, ʁ̂][70] uvular rounded '[χ̞̆ʷ, ʁ̞̆ʷ]'
[ʍ, ʁ][71] pharyngealized uvular '[χ̞̆ˤ, ʁ̞̆ˤ]'
[ʁ̂, ʁ̂][72] pharyngealized uvular rounded '[χ̞̆ˤʷ, ʁ̞̆ˤʷ]'
[ɾ, ʕ][73] prepharyngeal (= between the *upper* pharynx and the root of the tongue) '[ɦ̞̆, ʕ̞̆]'
[ɾ̠, ʢ][74] pharyngeal (= between the *lower* pharynx and root of tongue, 'epiglottal') '[ʜ̟̆, ʢ̟̆]'
[ɾ̠̈, ʢ̈][75] pharyngeal rounded '[ʜ̟̆ʷ, ʢ̟̆ʷ]'.

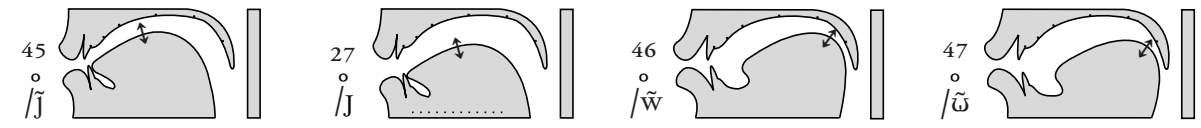
fig 10.6.3. Back approximant & semi-approximant orograms (8).



10.6.4. *Nasalized* approximants [j̃] (4). The difference between these and semi-nasals (in § 10.2.3) lies in the fact that these are normal contoids, with the addition of a lowered velum, whereas the others are nasals with an incomplete contact. In fact, in *fig* 10.6.1, we have indicated double arrows as well (as in *fig* 5.1), to show the exact combination of the two articulation manners – by insisting and slightly exaggerating. (The same happens to other contoids –as constrictives, taps, or laterals– with added nasalization.)

[/, j̃][76] palatal *dynamic* (with a *lowered* velum) '[j̃]'
[/, j̃][77] *semi*-palatal *dynamic* (with a *lowered* velum) '[j̃̆]'

fig 10.6.4. Nasalized approximant & semiapproximant orograms (4).



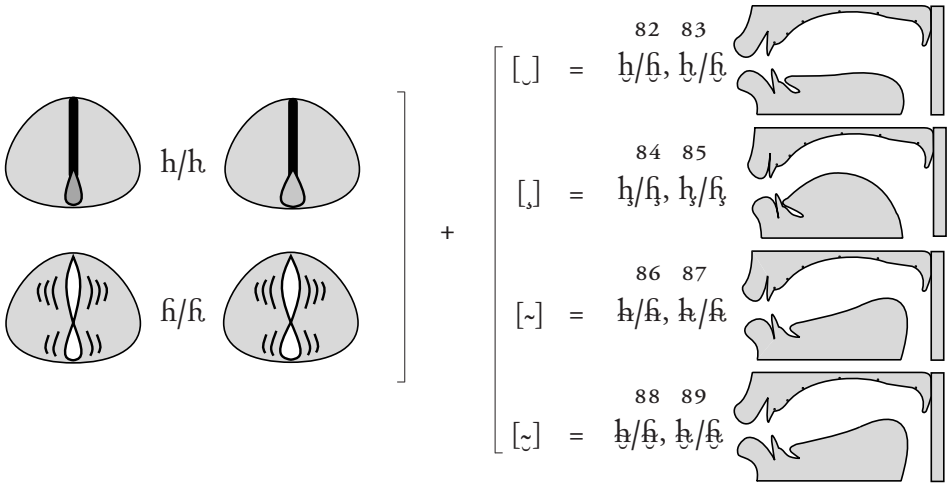
[/, w̃][78] velar rounded *dynamic* (with a *lowered* velum) '[w̃]'
[/, ʊ̃][79] *semi*-velar rounded *dynamic* (with a *lowered* velum) '[ʊ̃]'.

10.6.5.1. Lenited *laryngeal* approximants [H] (10, including semi-approximants, which are laxer, using less expiratory air. Others are possible).

[h, ɦ][80] laryngeal (= between the vocal folds, including the arytenoid cartilages) '[h̬, ɦ̬]'
[h, ɦ][81] *semi*-laryngeal (= between the vocal folds, including the arytenoid cartil.) '[h̬, ɦ̬]'
[h̫, ɦ̫][82] laryngeal rounded (= with lip rounding) '[h̬ʷ, ɦ̬ʷ]'
[h̫, ɦ̫][83] *semi*-laryngeal rounded (= with lip rounding) '[h̬ʷ, ɦ̬ʷ]'
[hʲ, ɦʲ][84] palatalized laryngeal (= betw. the vocal folds, including the aryten. cartil.) '[h̬ʲ, ɦ̬ʲ]'
[hʲ, ɦʲ][85] palatalized *semi*-laryngeal (= betw. the vocal folds, including aryten. cartil.) '[h̬ʲ, ɦ̬ʲ]'
[ɦ̴, ɦ̴][86] velarized laryngeal (with velarization) '[h̬˞ˠ]'
[ɦ̴, ɦ̴][87] velarized *semi*-laryngeal (with velarization) '[h̬˞ˠ]'
[ɦ̴̫, ɦ̴̫][88] velarized laryngeal rounded (with velarization & rounding) '[ʍ̬˞]'
[ɦ̴̫, ɦ̴̫][89] velarized *semi*-laryngeal rounded (with velarization & rounding) '[ʍ̬˞]'.

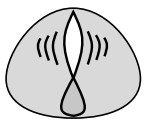
fig 10.6.5.1. Lenis voiced & voiceless approximant and semi-approximant laryngograms (4).

fig 10.6.5.2. Lenis voiced & voiceless approximant and semi-approximant laryngograms (with lip rounding, palatalization, velerization, and rounding & velarization – 6).



10.6.5.2. Laryngeal approximant with *intermediate* phonation and some coarticulations, as in § 10.6.3.1 (the difference lies in their laryngoid, shown on the right – 5).

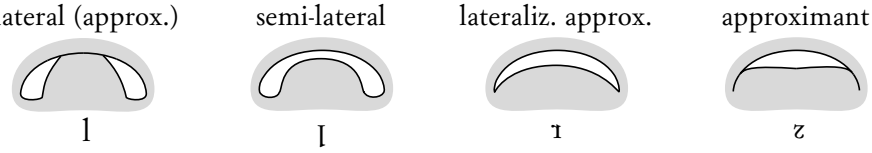
⟦ɦ⟧ laryngeal (with intermediate phonation) '[h̝]'
⟦ɦ̫⟧ laryngeal rounded (with intermediate phonation) '[h̝ʷ]'
⟦ɦʲ⟧ palatalized laryngeal (with intermediate phonation) '[h̝ʲ]'
⟦ɦ̴⟧ velarized laryngeal (with intermediate phonation) '[h̝˞ˠ]'
⟦ɦ̴̫⟧ velarized laryngeal rounded (with intermediate phonation) '[ʍ̝˞]' .



10.6.6. *Lateralized* apico-laminal approximants, with other coarticulations [ɭ] (some with lip-rounding, as well – 9). Let us make it clear that *lateralized* does not coincide with *lateral* (nor with *semi-lateral*). As the first four linguograms in *fig* 10.9.9 (that we reproduce here, as *fig* 10.6.6.1) show, the mechanism is partially different: for *(bi)lateral* (and *semi(bi)lateral*) articulations, the lower parts of the sides of the tongue are completely moved away from the side teeth. The difference between them is that (full) laterals have a contact with the upper part of the mouth roof, while semi-laterals do not have it.

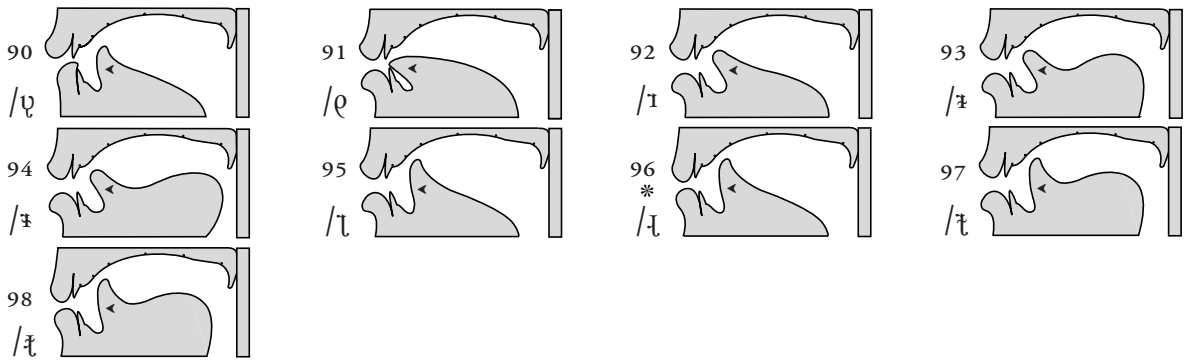
Lateralized phones, on the other hand, lack such a consistent space on both sides of the tongue. They have just a smaller space, which normal approximants lack. In addition, to be of greater help, the orograms of (semi)lateral have an arrow (bigger for full laterals), while added lateralization is shown by a simple head of an arrow (which, of course, is not present on normal approximants).

fig 10.6.6.1. Linguograms of lateral, semi-lateral, and lateralized articulations in comparison with normal approximant ones.



[ɭ, ᶣ][90]	labiodentalized postalveolar slightly rounded (with lateral contraction) '[ʊ͡ɻ̟ʷ]'
[ɭ, ᶢ][91]	dental, or lamino-dental (= with a *lowered* tip and with lateral contraction) '[ɻ̪̊]'
[ɭ, ɪ][92]	alveolar (with lateral contraction) '[ɻ̟]'
[ɭ, ɬ][93]	velarized alveolar (with lateral contraction) '[ɻ̟ˠ]'
[ɭ, ɬ][94] [ɬ]	uvularized alveolar (with lateral contraction) '[ɻ̟ˤ]'
[ɭ, ɻ][95]	postalveolar: (apico-)… (with lateral contraction) '[ɻ̠]'
[ɭ, ɻ][96]	postalveolar slightly rounded: (apico-)… (with lateral contraction) '[ɻ̠ʷ]'
[ɭ, ɻ][97]	velarized postalveolar: (apico-)… (with lateral contraction) '[ɻ̠ˠ]'
[ɭ, ɻ][98]	velarized postalveolar slightly rounded: (apico-)… (with lateral contract.) '[ɻ̠ˠʷ]'.

fig 10.6.6.2. Lamino-lateralized approximant orograms (9).



10.6.7. *Lateralized* approximants and semi-approximants (with postaveolar and labial coarticulations; the last one without the latter) [ɭ*, ᶩ] (5).

[/, ɹ][99] postalveolarized prevelar slightly rounded (with lateral contraction) '[ɹ̟̊˗ʷ]'

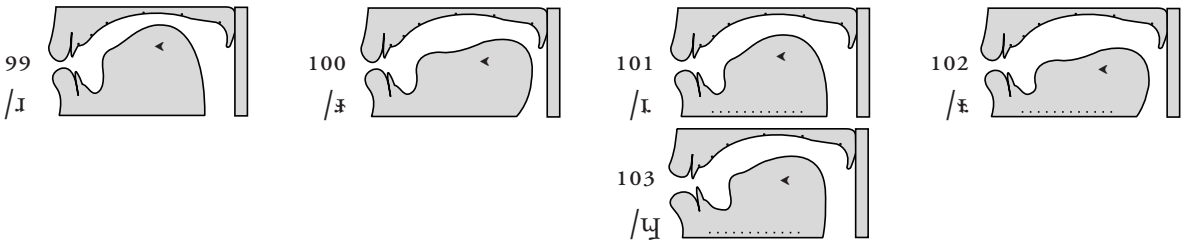
[[/, ɹ]][100] [ɹ] postalveolarized *semi*-prevelar slightly rounded (with lateral contraction – but with very wide narrowing) '[ɹ̟̊˗ʷ]'

[[/, ɻ]][101] [ɻ] uvulo-postalveolarized velar slightly rounded (with lateral contraction) '[ɻ̟̊˗ˠʷ]'

[[/, ɻ]][102] [ɻ] [ɻ] uvulo-postalveolarized *semi*-velar slightly rounded (with lateral contraction – but with very wide narrowing) '[ɻ̟̊˗ˠʷ]'.

[/, ɥ̠][103] *semi*-provelar (with no labialization) '[ɯ̠]'

fig 10.6.6.3. Dorso-lateralized approximant and semi-approximant orograms (with slight post-alveolarization – 5).



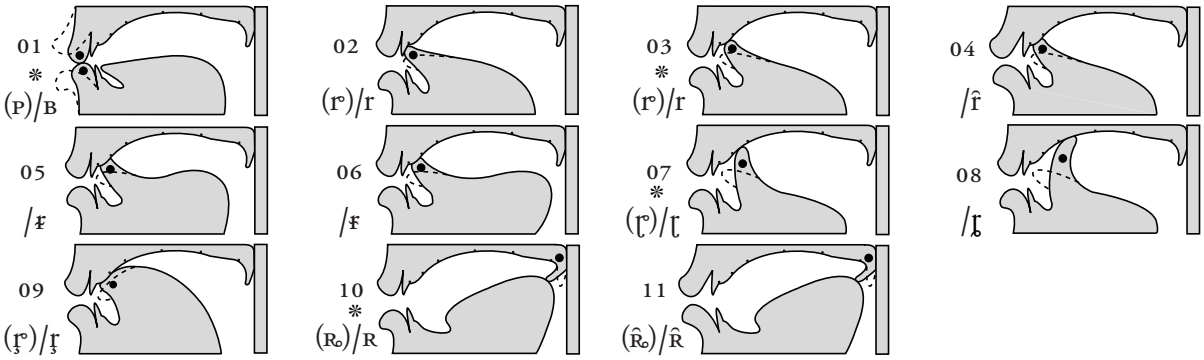
Trills, taps & flaps /R/ [R, Я, ɾ, ʀ, ɾ] (40)

10.7. These include three synopses for trills, taps, flaps; and two more, for *constrictive* trills and taps; finally, we find *lateralized* taps and flaps. The synopses of tapped laterals are with those of laterals. Our orograms clearly show that *taps* and *flaps* are two very different contoid categories.

10.7.1. *Trills* [R] (11).

[(ᴘ), ʙ]01 bilabial '[ʙ̥, ʙ]' (≠, =)
([(ɾ̼), ɾ])02 dental (with *raised* tip) '[r̥̼, r̼]'
[(ɾ), ɾ]03 alveolar (apical) '[r̥, r]'
[/, r̂]04 alveolar rounded '[rʷ]'
[/, ɾ]05 velarized alveolar '[rˠ]'
[[/, ɾ]]06 [ɾ] uvularized alveolar '[rˠ]'
[(ɽ), ɽ]07 postalveolar: (apico-)… (not laminal) '[ɽ̥, ɽ]' (≠)
[/, ʄ]08 apico-palatal '[c͡ɟ]' (≠)
[(ɻ), ɻ]09 prepalatal: (lamino-)… '[ɻ̟̊ʲ, ɻ̟ʲ]'
[(ʀ̥), ʀ]10 uvular '[ʀ̥, ʀ]' (≠, =)
[(r̥̂), r̂]11 uvular rounded '[ʀ̥ʷ, ʀʷ]'.

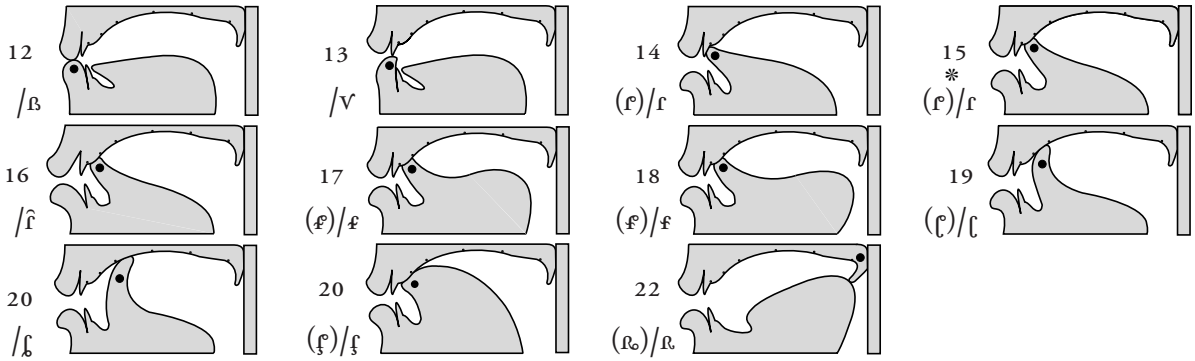
fig 10.7.1. Trill orograms (11).



10.7.2. *Taps* [Я] (11).

[/, ʁ]12 bilabial '[ʁ̆/w̆]'
[/, ѵ]13 labiodental '[ѵ]' (=)
([(ɾ), ɾ])14 dental (with *raised* tip) '[r̥, r]'
[(ɾ), ɾ]15 alveolar (with *raised* tip) '[r̥, r]'
[/, r̂]16 alveolar rounded '[rʷ]'
[(ɾ), ɾ]17 velarized alveolar '[r̥ˠ, rˠ]'
[(ɾ), ɾ]18 [[ɾ, ɾ]] uvularized alveolar '[r̥ˠ, rˠ]'
[(ɽ), ɽ]19 postalveolar: (apico-)… (not laminal) '[ɽ̥, ɽ]'
[/, ʄ]20 apico-palatal (palatal and apical, not laminal) '[c̟]'
[(ɻ), ɻ]21 prepalatal: (lamino-)… '[ɻ̟̊ʲ, ɻ̟ʲ]'
[(ʀ̥), ʁ]22 uvular '[ʁ̆, ʁ̆]'.

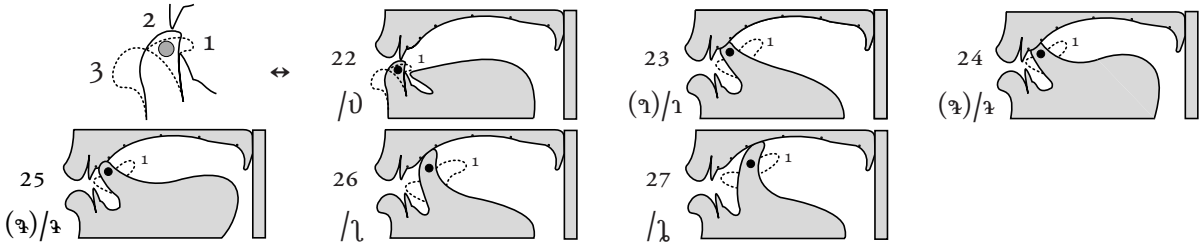
fig 10.7.2. Tap orograms (11).



10.7.3. *Flaps* [Ɍ] (6).

[/, ʋ][23] labiodental (= between the lower lip and the upper teeth) '[ʋ̈/ʋ̌/ⱱ]'
[(ɹ), ɹ][24] alveolar '[ɾ̥⃗, ɾ⃗]'
[(ɻ), ɻ][25] velarized alveolar '[ɾ̥⃗ˠ, ɾ⃗ˠ]'
[(ɻ), ɻ][26] ⟦ɻ, ɻ⟧ uvularized alveolar '[ɾ̥⃗ˁ, ɾ⃗ˁ]'
[/, ɺ][27] postalveolar: (apico-)… '[ɺ⃗]'
[(ɺ), ɺ][28] apico-palatal (not laminal) '[ɺ̥⃗, ɺ⃗]'.

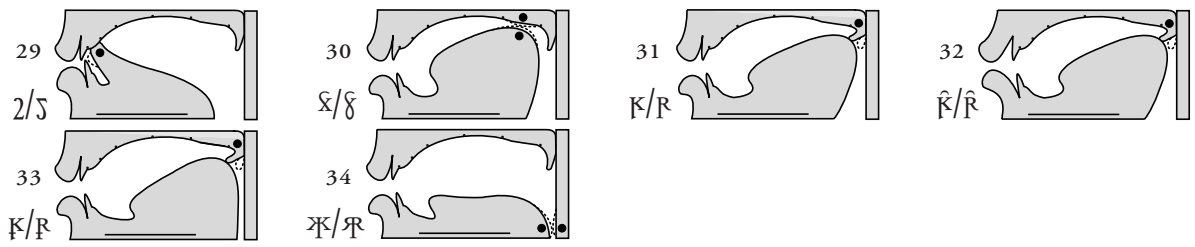
fig 10.7.3. Flap orograms (6).



10.7.4. *Constrictive* trills [ʀ] (6).

[ʡ, ʢ][29] alveolar (with raised tip and narrowing which produces friction noise) '[ʡ̟̞, ʡ̠̞]'
⟦x, ɣ⟧[30] [x, ɣ] velar (with friction noise) '[x̞̟ˠ, ɣ̞̠ˠ]'
⟦ʟ, ʀ⟧[31] [χ, ʁ] uvular (with friction noise) '[χ̞̟, ʁ̞̠]'
⟦ʟ̂, ʀ̂⟧[32] uvular rounded (with friction noise) '[χ̞̟ʷ, ʁ̞̠ʷ]'
⟦ʟ, ʀ⟧[33] pharyngealized uvular (with friction noise) '[χ̞̟ˤ, ʁ̞̠ˤ]'
⟦ʜ, ʢ⟧[34] pharyngeal (between the *lower* phar. & root of t.; with friction noise) '[ʜ̞̟͡ʡ̞̠, ʢ̞̠͡ʡ̞̠]'.

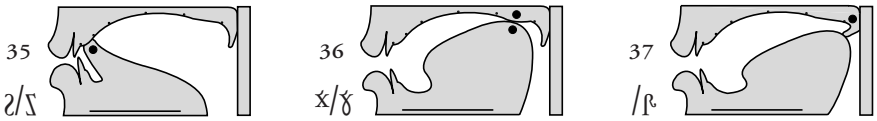
fig 10.7.4. Constrictive trill orograms (6).



10.7.5. *Constrictive* taps [ʀ*] (3).

[ɻ, ɽ][35] alveolar (with raised tip and narrowing which produces friction noise) '[ɹ̝̊, ɹ̝]'
[x, ɣ][36] velar (with friction noise) '[x̝̊, x̝]'
[/, ʁ][37] uvular (with friction noise) '[χ̝]'.

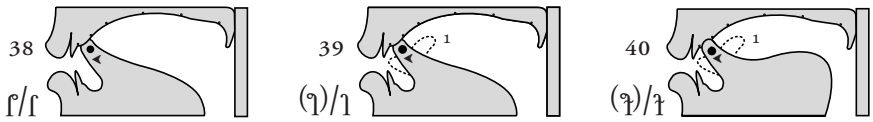
fig 10.7.5. Constrictive tap orograms (3).



10.7.6. *Lateralized* taps & flaps [ʁ̆] (3).

[(ɾ), ɾ][38] alveolar *tap* (with *raised* tip) '[ɹ̆̊, ɾ̆]'
[(ɳ), ɳ][39] alveolar *flap* (with *raised* tip) '[ɹ̆̊, ɹ̆]'
[(ɻ), ɻ][40] velarized alveolar *flap* (with *raised* tip) '[ɹ̆̊ˠ, ɹ̆ˠ]'.

fig 10.7.6. Lateralized orograms: tap and flap.



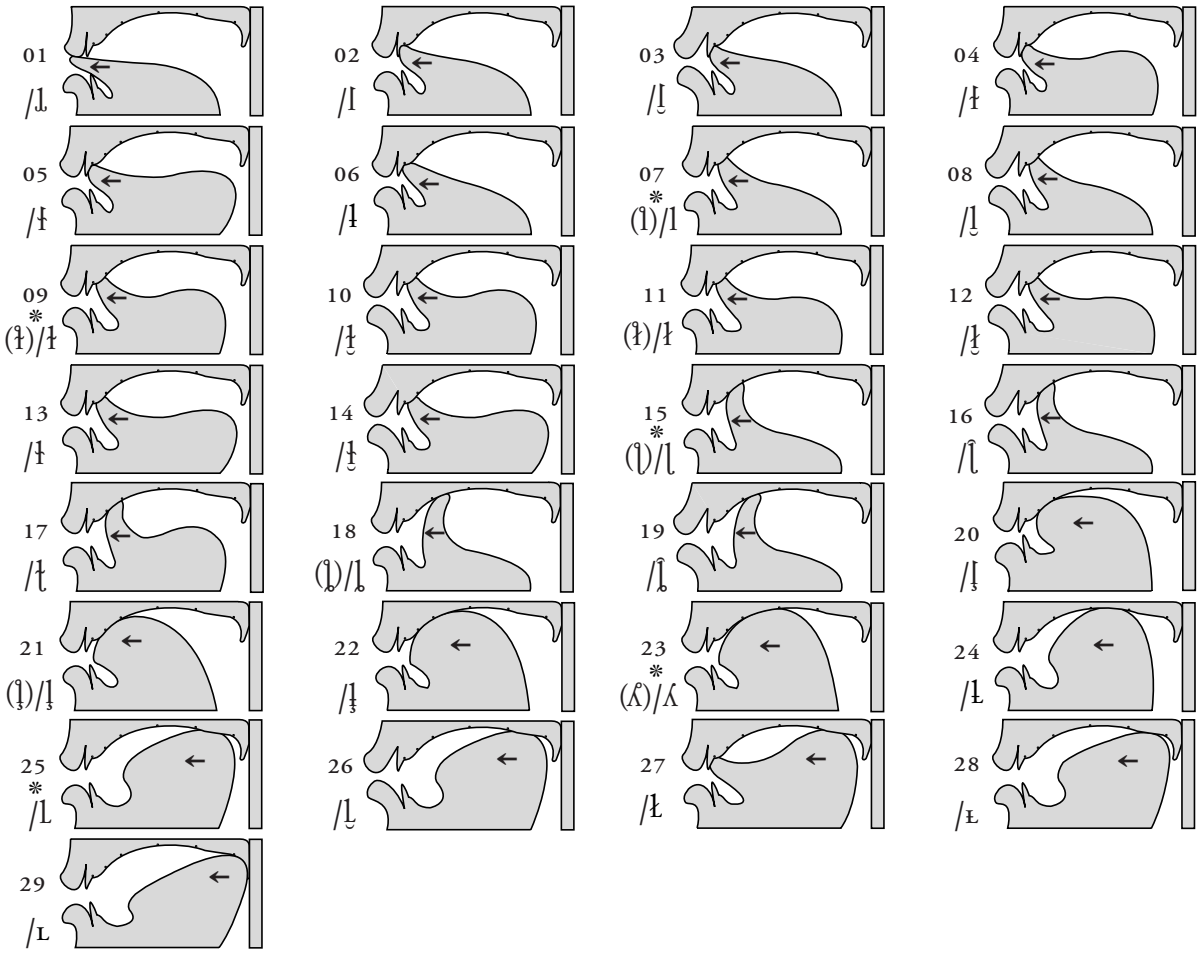
Laterals /L/ [L, ʟ, ɬ, ɺ, ˪] (67)

10.8. These include five synopses for (bi)laterals, *uni*laterals, constrictive laterals, lateral taps; semi-laterals; finally, the symbol for a diaphone is added, [ɬ] (which can be called either 'lateralized tap' or 'tapped lateral', for oscillations between [ɾ, ɽ, ɺ, l]).

10.8.1. *Laterals* [L] (29).

[/, ɭ̼]01 labial-apical (= between the upper lip and the tip of the tongue) '[l̼]'
[[/, l̪]]02 [l] dental, or predental (with *raised* tip) '[l̪]'
[[/, l̪̟]]03 [l̪] dental rounded '[l̪ʷ]'
[[/, ɬ̪]]04 [ɬ] velarized dental '[l̪ˠ] or [ɬ̪]'
[[/, ɬ̪]]05 (or [ɬ̪]) [ɬ] uvularized dental '[l̪ˠ] or [ɬ̪]'
[[/, ɬ̪]]06 [l] denti-alveolar (= intermediate between the teeth and the alveoli) '[l̪]'
[(l̥), l]07 alveolar (= between the alveoli and the tip of the tongue) '[l̥, l]'
[/, l̥̟]08 alveolar rounded '[l̥ʷ]'
[(ɬ̥), ɬ]09 velarized alveolar '[l̥ˠ], [l̥ˠ] or [ɬ̥], [ɬ̥]'
[/, ɬ̥̟]10 velarized alveolar rounded '[l̥ˠʷ] or [ɬ̥ʷ]'
[(ɬ̥), ɬ]11 *semi*-velarized alveolar (with reduced velar narrowing than [ɬ]) '[l̥̞ˠ, l̞ˠ] or [ɬ̥̞, ɬ̞]'
[/, ɬ̥̟]12 *semi*-velarized alveolar rounded '[l̥̞ˠʷ] or [ɬ̥̞ʷ]'

fig 10.8.1. (Bi)lateral orograms (29).

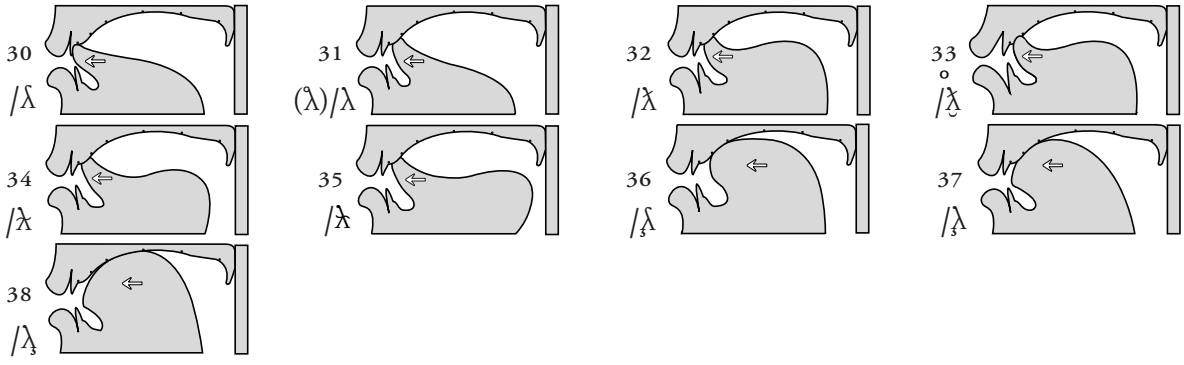


[[/, ɬ]][13] (or [ɬ̪]) [ɬ] uvularized alveolar '[l̪ˠ] or [ɬ̪]'
[[/, ɬ̪]][14] (or [ɬ̪]) [ɬ̪] uvularized alveolar rounded '[l̪ˠʷ] or [ɬ̪ʷ]'
[(/),]][15] postalveolar: (apico-)… (not laminal) '[,]' (≠, =)
[/,]][16] postalveolar rounded: (apico-)… '[ʷ]'
[/, ɬ]][17] velarized postalveolar '[ˠ]'
[(/),]][18] apico-palatal (= between the palate and the tip) '[,]'
[/,]][19] apico-palatal rounded '[ʷ]'
[[ɻ]][20] [ɻ] postalveo-palatal: (lamino-)… '[ɻʲ]'
[(/), ɻ]][21] pre-palatal: (lamino-)… '[ʲ, ʲ]'
[/, ɻ]][22] pro-palatal (= between prepalatal and palatal) '[]' (≠)
[(/),]][23] palatal '[,]' (≠, =)
[/, ɬ]][24] prevelar '[]'
[/, ʟ]][25] velar (= betw. the velum and the back of tongue; not 'velarized [alveol.]') '[ʟ]' (≠)
[/,]][26] velar rounded '[ʟʷ]'
[/, ɬ]][27] velar–alveolar '[]'
[/, ʁ]][28] preuvular '[ʁ]'
[/, ʟ]][29] uvular '[]'.

10.8.2. *Unilaterals* [Ɬ] (9).

[[/, ʎ]][30] [l] dental: (lamino-)… (air passing only, or mostly, around one side of the tongue) '[]'
[[(),]][31] [l] alveolar '[,]'
[[/,]][32] prevelarized alveolar '[]'
[[/,]][33] prevelarized alveolar rounded '[ˠʷ]'
[[/,]][34] [ɬ] velarized alveolar '[ˠ]'
[[/,]][35] (or [ɬ]) [ɬ] uvularized alveolar '[]'
[[/, ɻ]][36] [ɻ] postalveo-palatal: (lamino-)… '[ɻʲ]'
[[/,]][37] [] prepalatal: (lamino-)… '[ʲ]'
[[/,]][38] [] palatal: (lamino-)… '[]'.

fig 10.8.2. Unilateral orograms (9).

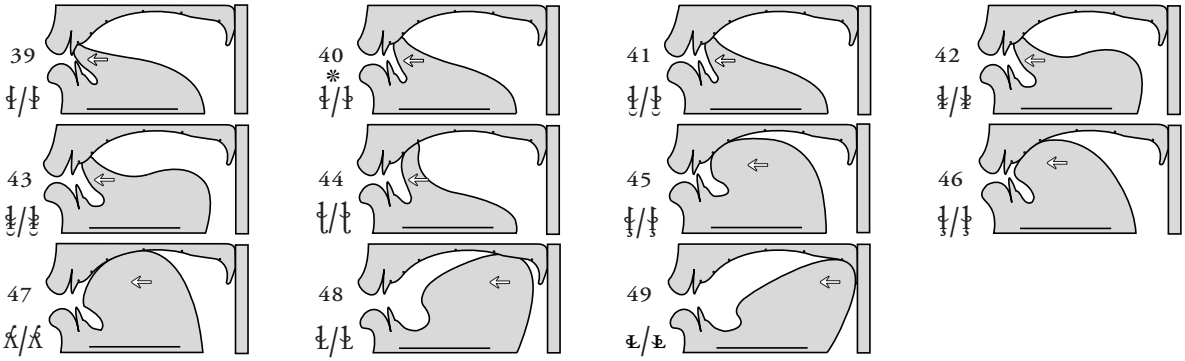


10.8.3. *Constrictive (uni)*laterals [Ɬ] (11).

[[ɬ, ɬ]][39] [ɬ, ɬ] dental, or predental (with friction noise) '[,]'
[ɬ, ɬ][40] alveolar (with friction noise) '[,]'
[,][41] alveolar rounded (with friction noise) '[ʷ, ʷ]'
[,][42] velarized alveolar (with friction noise) '[ˠ, ˠ]'

[ɬ̪, ɮ̪][43] velarized alveolar rounded (with friction noise) '[ɬ̪ˠʷ, ꞎˠʷ]'
[ɬ̠, ɮ̠][44] postalveolar: (apico-)… (not laminal – with friction noise) '[ɬ̠, ꞎ̠]'
[[ɬ̟, ɮ̟]][45] [ɬ̟, ɮ̟] postalveo-palatal: (lamino-)… (with friction noise) '[ɬ̟ʲ, ꞎ̟ʲ]'
[ɬ̟, ɮ̟][46] prepalatal: (lamino-)… (with friction noise) '[ɬ̟ʲ, ꞎʲ]'
[ʎ̝, ʎ̝][47] palatal (with friction noise) '[ɬ͡ʎ̝, ꞎ͡ʎ̝] or [ʎ̝˖˔, ʎ̝˕˔]'
[ɬ, ɮ][48] velar (not 'velarized [alveolar]' – with friction noise) '[ɬ͡ʟ, ꞎ͡ʟ] or [ʟ˖˔, ʟ˕˔]'
[ɬ̴, ɮ̴][49] uvular (with friction noise) '[ɬ͡ʟ̴, ꞎ͡ʟ̴] or [ʟ̴˖˔, ʟ̴˕˔]'.

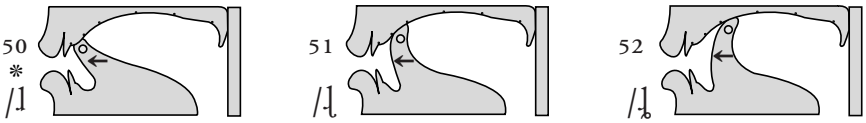
fig 10.8.3. Constrictive (uni)lateral orograms (11).



10.8.4. *Tapped* laterals [ɾ] (3).

[/, ɾ][50] alveolar '[ɾ]' (≡)
[/, ɾ̠][51] postalveolar: (apico-)… (not laminal) '[ɾ̠]'
[/, ɾ̟][52] apico-palatal (= between the [hard] palate and the tip) '[ɾ̟]'.

fig 10.8.4. Tapped lateral orograms (3).

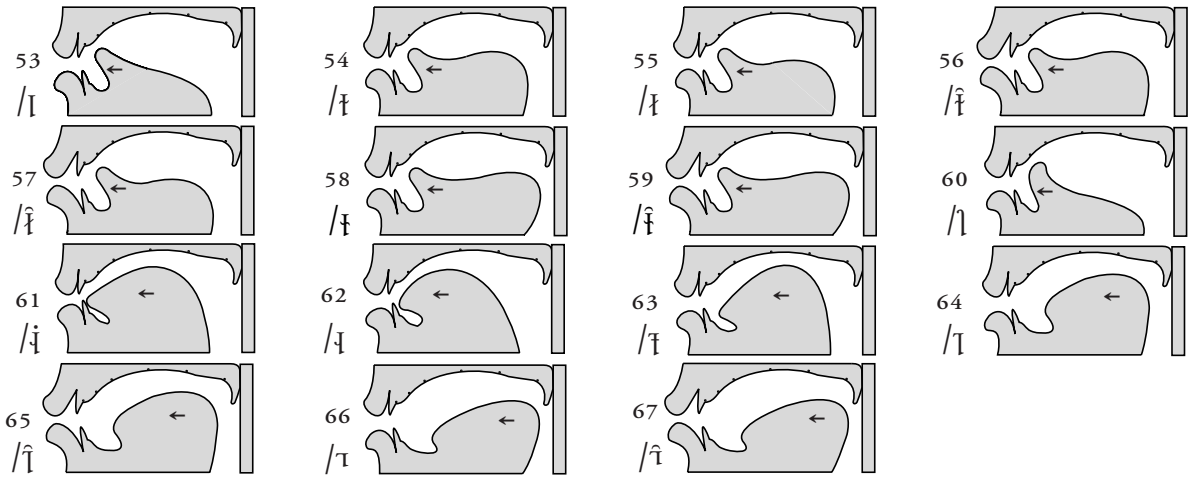


10.8.5. *Semilaterals* (or lateralized approximants) [ʟ] (15).

[[/, ɭ]][53] [l] alveolar (with lateral contraction) '[ɭ̥]'
[[/, ɬ̠]][54] [ɬ] velarized alveolar (with lateral contraction) '[ɭ̥ˠ]'
[[/, ɬ̠]][55] [ɬ] semivelarized alveolar (with lateral contraction) '[ɭ̥ˠ̞]'
[[/, ɬ̪]][56] [ɬ] velarized alveolar rounded (with lateral contraction) '[ɭ̥ˠʷ]'
[[/, ɬ̪]][57] [ɬ] semivelarized alveolar rounded (with lateral contraction) '[ɭ̥ˠ̞ʷ]'
[[/, ɬ̟]][58] [ɬ] uvularized alveolar (with lateral contraction) '[ɭ̥ˁ]'
[[/, ɬ̟]][59] [ɬ] uvularized alveolar rounded (with lateral contraction) '[ɭ̥ˁʷ]'
[[/, ɭ̠]][60] [l̠] postalveolar (with lateral contraction) '[ɭ̠]'
[[/, ʎ̟]][61] [ʎ̟] pre-palatal (with lateral contraction) '[ʎ̟]'
[[/, ʎ̝]][62] [ʎ̝] palatal (with lateral contraction) '[ʎ̝]'
[[/, ʟ̝]][63] [ʟ] prevelar (with lateral contraction) '[ʟ̝]'
[[/, ʟ]][64] [ʟ] velar (with lateral contraction) '[ʟ]'

⟦/, ɻ̂⟧[65] [ɭ] velar rounded (with lateral contraction) '[ɭ̟ˠʷ]'
⟦/, ɹ⟧[66] [ɻ] uvular (with lateral contraction) '[ɭ̠]'
⟦/, ɻ̂⟧[67] [ɻ] uvular rounded (with lateral contraction) '[ɭ̠ˠʷ]'.

fig 10.8.5. Semi-laterals, or lateralized approximants (15).



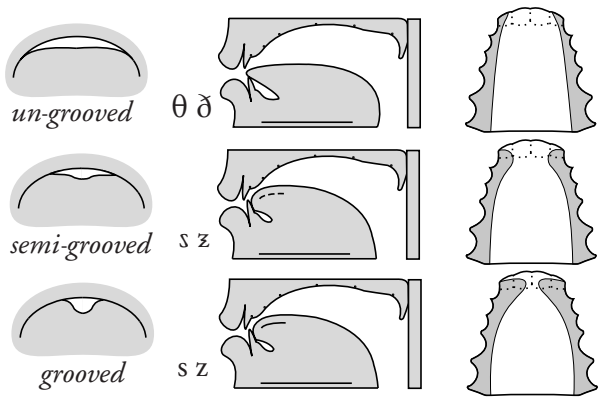
10.8.6. As already pre-empted in § 10.8, we also give the 'diaphone' [ɬ] (*ie* either a 'lateralized tap' or a 'tapped lateral' (or something else), for possible oscillations between [ɾ, ɽ] and [ɺ, l]). Of course, our symbol is the combination of [ɾ] and [l]. As a matter of fact, it is no easy task to try to show it with a suitable orogram, given its particular nature. We leave the task of devising possible *offIPA* 'transcriptions' to the imagination of careful readers.

Appendix

Intermediate contoids: semi-grooved

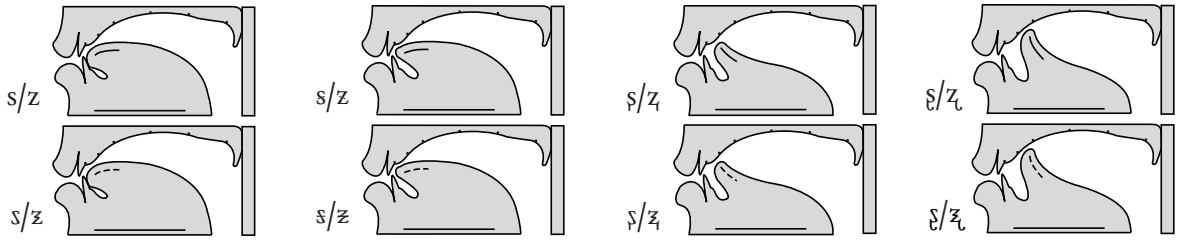
10.9.1. *Semi-grooved* constrictives & stop-strictives can also occur. There follows an illustration showing the difference between *un-grooved*, *semi-grooved* and *grooved* dental constrictive contoids, as a necessary exemplification.

fig 10.9.1. Comparison between plain (un-grooved, or 'slit'), semi-grooved, and grooved dental contoids.



Now, for comparison, we show the orograms of grooved and semi-grooved dental, denti-alviolar, alveolar and postalveolar constrictives.

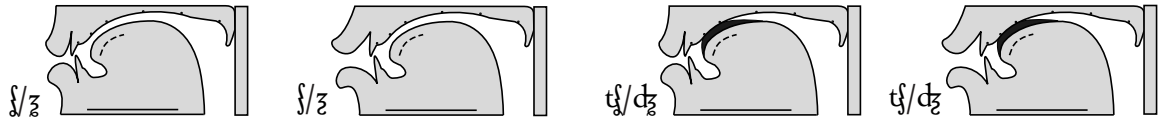
fig 10.9.2. Some grooved and semi-grooved constrictive orograms.



Here, we just show the two most frequent semi-grooved stop-strictives and their correspondent constrictives (but of course, others are possible).

In certain societies, semigrooved contoids are often (though not always) associated with gay-male lisp.

fig 10.9.3. Some semi-grooved constrictive and stop-strictive orograms.

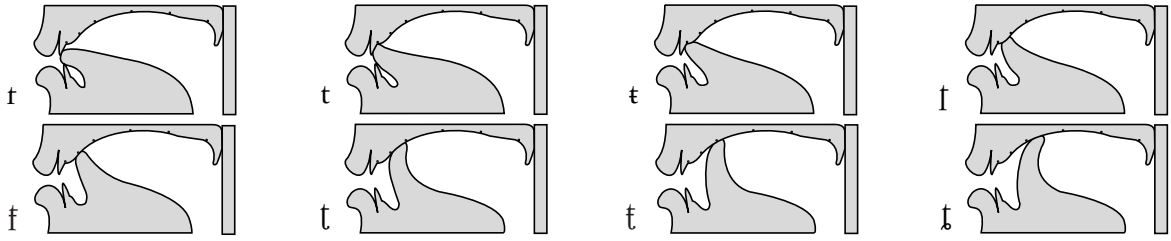


Comparisons between similar contoids

10.9.2. For *nasals*, to closely examine their many articulatory possibilities, we can consider the position of German, as it emerges mainly from § 5.2.1-7 of *HPr*. We have indicated many coarticulatory combinations, by using both (more) 'normal' and (more) 'special' symbols. Certainly, this has been done not for the sake of useless pedantry, but rather to fully describe native speakers' 'spontaneous and automatic' phonetic reality, in order to allow even non-native speakers to use what natives actually do. In fact, for the 3 nasal phonemes of German, /m, n, ŋ/, we have 6 taxophones, [m, ɱ, n, n̪, ŋ, ɴ], and some special ones, ⟦ᵐ, ⁿ, ᵑ⟧ (if necessary, ⟦ᵑ̊⟧, too). For the 2 intense ('syllabic') nasals, /m̩, n̩/, we have 6 more normal taxophones, [m̩, ɱ̩, n̩, n̪̩, ŋ̩, ɴ̩], and 9 special ones ⟦m̩ˠ, n̩ˠ, ŋ̩ˠ, m̩ʰ, ɱ̩ʰ, n̩ʰ, n̪̩ʰ, ŋ̩ʰ, ɱ̩ʲ⟧ (if necessary, ⟦n̪̩ʰ⟧, too). They are all given in *fig* 10.2.1-2 (with others).

10.9.3. For *stops*, let us carefully observe the characteristics of some (voiceless) phones, belonging to the apical group (predental, dental, denti-alveolar, alveolar, postalveolar, apico-palatal), [(t), t, t̪, ɪ, ʈ, c̣]. We find the last five respectively in: Spanish *tú* [ˈtu], German *Tod* [ˈt̪hoːt̪], English *tat* [ˈtʰæɪ], Hindi *ṭaaṭ* [ˈʈaaʈ], and Tamil *ṭii* [ˈc̣ii]. The first orogram in *fig* 10.9.4 adds the predental articulation which in Malayalam opposes /ʈ/ [c̣] (and, in traditional pronunciation, also /ɪ/ [ɪ], which in modern pronunciation merges into /t/ [t]; thus, they can both become [t]): *muṯṯu* [ˈmʊtːʊ], *muttu* [ˈmʊɪːʊ], *muṭṭu* [ˈmʊc̣ːʊ]. Others are possible (*fig* 10.9.4).

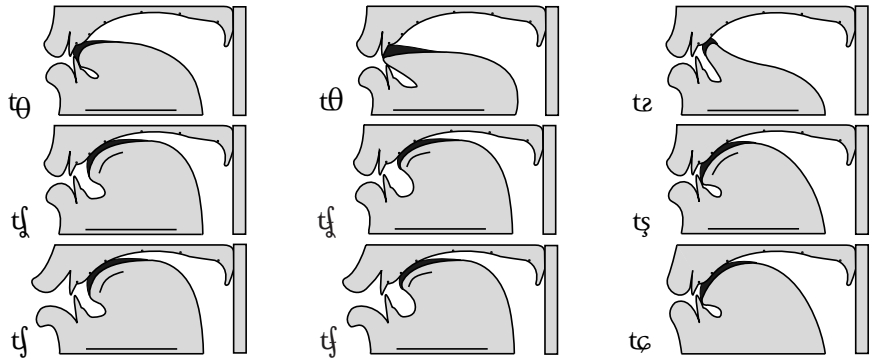
fig 10.9.4. Comparisons between some (voiceless) stops: prodental, dental, denti-alveolar, alveolar, back-alveolar, postalveolar, back-postalveolar, apico-palatal.



10.9.4. For *stopstrictives*, let us expressly consider some groups, in order to see their nuances well, since too often they are described badly. For simplicity, we will see voiceless phones only. The first three we consider are (prodental, dental, and alveolar) un-grooved contoids, [t̪θ, tθ; tɹ]. We find the first two in regional Italian pronunciations from Trentino (in north-eastern Italy), for /ts/: *marzo* [ˈmɑːɾt̪θo, -tθo] (for neutral Italian [ˈmaɾːtso]), and [tɹ], in Sicily, for /tr/: *tre* [ˈtɹɛ, ˈtɹɛɐ] (this is the 'legendary' –and 'phonetic-fiction'– 'cacuminal' sequence *'ṭṛ'*, for [ˈtre]).

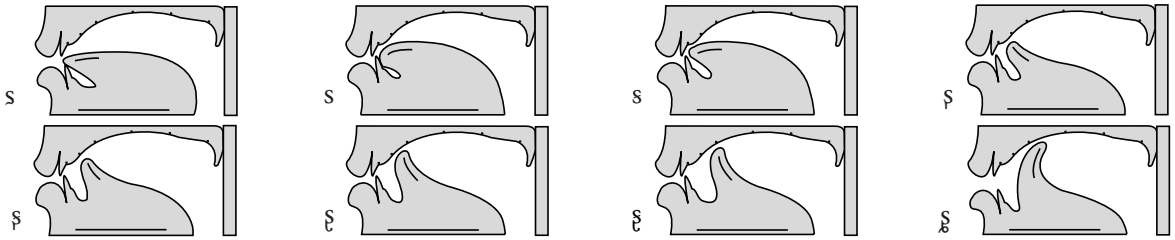
It is useful to also consider the grooved triple set, with no lip-rounding nor lip-protrusion – postalveo-palatal with a lowered or raised tip, and prepalatal: [t̠ʃ̠], ⟦t̠ʃ̠⟧, [tʂ], as in typical pronunciations in northern Italy, for /tʃ/: *cera* [ˈt̠ʃ̠eːɾa, t̠ʃ̠-, tʂ-], /ˈtʃera/. Let us also consider the pair with lip-protrusion: [tʃ], as in neutral Italian [ˈtʃeːɾa]; ⟦tʃ⟧, as in English *chain* [ˈtʃhɛɪn] /ˈtʃɛɪn/ and German *deutsch* [ˈd̥ɔʏtʃ] /ˈdɔʏtʃ/. Finally, let us observe [tɕ], as well, with vertical labialization (not rounding or protrusion), as in Chinese *jī* [ˉtɕi] /ˉtɕi/.

fig 10.9.5. Comparisons between some (voiceless) stop-strictives.



10.9.5. In addition, it is worthwhile considering the set of eight *grooved constrictives*. For instance, [s, ʂ, ɕ, ʂ], can occur respectively in neutral Italian, regional Italian (of upper-southern and northern parts), and regional Italian (of other northern parts), as in *sí* [ˈsi, ˈʂi, ˈɕi, ˈʂi] /ˈsi/ (or of variants of Spanish; while neutral Castilian Spanish uses [ɕ], neutral American Spanish [s]). English speakers can actually use any of these four contoids, but the neutral one is ⟦s⟧, although generally transcribed with [s]: *sixty* ⟦ˈsɪksʃi⟧ [ˈsɪksʃi] /ˈsɪksti/.

fig 10.9.6. Comparisons between some (voiceless) grooved constrictives: prodental, dental, denti-alveolar, alveolar, back-alveolar, postalveolar, back-postalveolar, apico-palatal.



10.9.6. As far as *median approximants* are concerned, that is those produced within the phonetic space of vocoids (*cf fig* 8.1), it is very important to also observe

fig 10.9.7.

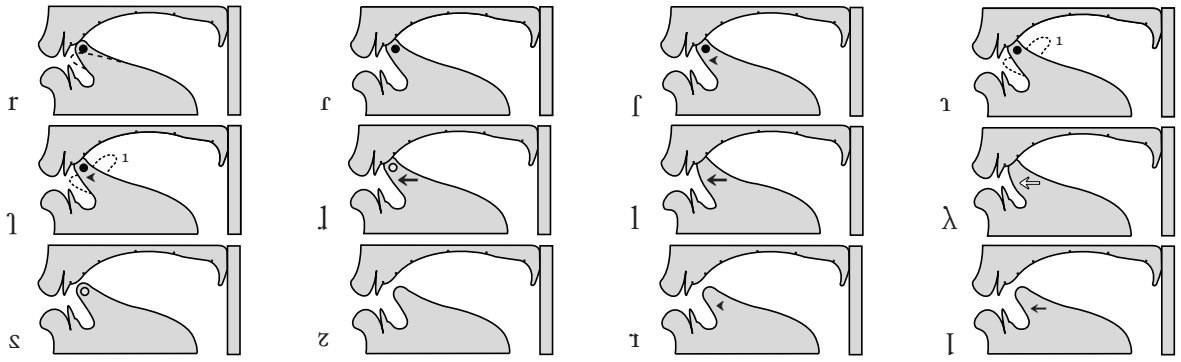
Comparisons between voiced median approximants (& similar nearby contoids).

	pre-palatal	palatal	postpalatal	pre-velar	pro-velar	velar	velarized alveolar	pre-palatal rounded	palatal rounded	postpalatal rounded	pre-velar rounded	pro-velar rounded	velar rounded	velarized alveolar ɾ	uvularized velar ɾ
constrictive		ɻ̟	ɹ̠	ɣ̟		ɣ			ɻ̂		ɧ̟		ɣ̊		
semi-constrictive		ɻ̞	ɹ̞	ʕ̟		ʕ			ɥ̞	ɰ̞	ɧ̞	ʍ̞	ʍ		
approximant	ɹ	j	ɻ	j̟	ɯ	ɯ		ɐ	ɥ	ɰ	ɧ	w	w		ʍ
semi-approxim.		ɹ	ɭ	ɪ̟	ɥ	ɥ			ɥ̠	ɰ̠	ɧ̠	ɷ	ɷ		ɷ
semi-lateral	ɬ	ɻ̊		ɬ̟		ɭ	ɬ						ɭ̂	ɬ̂	
high vocoids		i	ɪ	ɨ̟	ɯ	(ɯ)			ʏ	y	ʉ	ɯ̟	u		

some realizations with greater or lesser space between the dorsum and the palate, up to constrictive phones, by considering the following areas: (*prepalatal*,) *palatal*, *postpalatal*, *prevelar*, *provelar*, *velar* (and *uvularized velar*, too). We will present the voiced contoids in a synoptic way (whereas their articulations can be found in previous sections). It is to be noted that the median approximants (and semi--approximants) in this table are dynamic contoids (rather than static ones – *cf fig* 10.9.14-15). Besides, the high *vocoids*, that we show below the table, are there to help to connect them with the contoids.

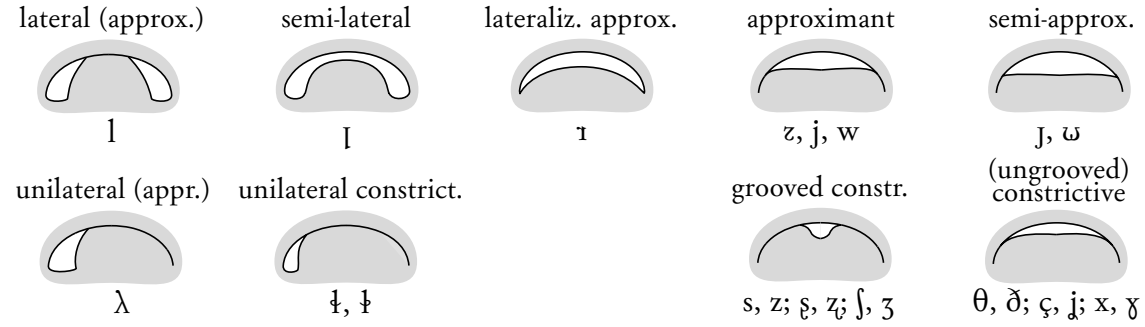
10.9.7. It is important to also consider some alveolar contoids, which can be difficult to distinguish. For the speakers of certain languages (mostly spoken in the Far East, as the various Chinese languages, and Japanese and Korean) they are a severe difficulty, since these differences are not present in the phonemic systems of those languages (*cf fig* 10.13 & § 9.33). Those Spanish accents which (really or presumably) neutralize the patterns /ɾC, lC/ can have [ɾ, ɾ̠, l̠, l] (with apical contact, *cf* § 10.8.6, as well), or [ꞅ, ꞅ̬, ɪ, ɭ] (with no such contact). The difference between the last three phones (and orograms) is fairly small: [ꞅ̬] lacks any lateral contraction, which is present in [ɪ] (as an added feature), and in [ɭ] (as a fundamental feature coupled with the lack of any apical contact). It is important to pay careful attention to the size of the arrows, too. The possible alveolar *semi-tap*, [ꞅ] is intermediate between [ɾ] and [ꞅ̬], with which it can actually alternate (and might –indeed– work as a diaphone, as well, *cf* § 10.8.6).

fig 10.9.8. Comparisons between trills, taps, flaps, laterals, approximants (& combinations).



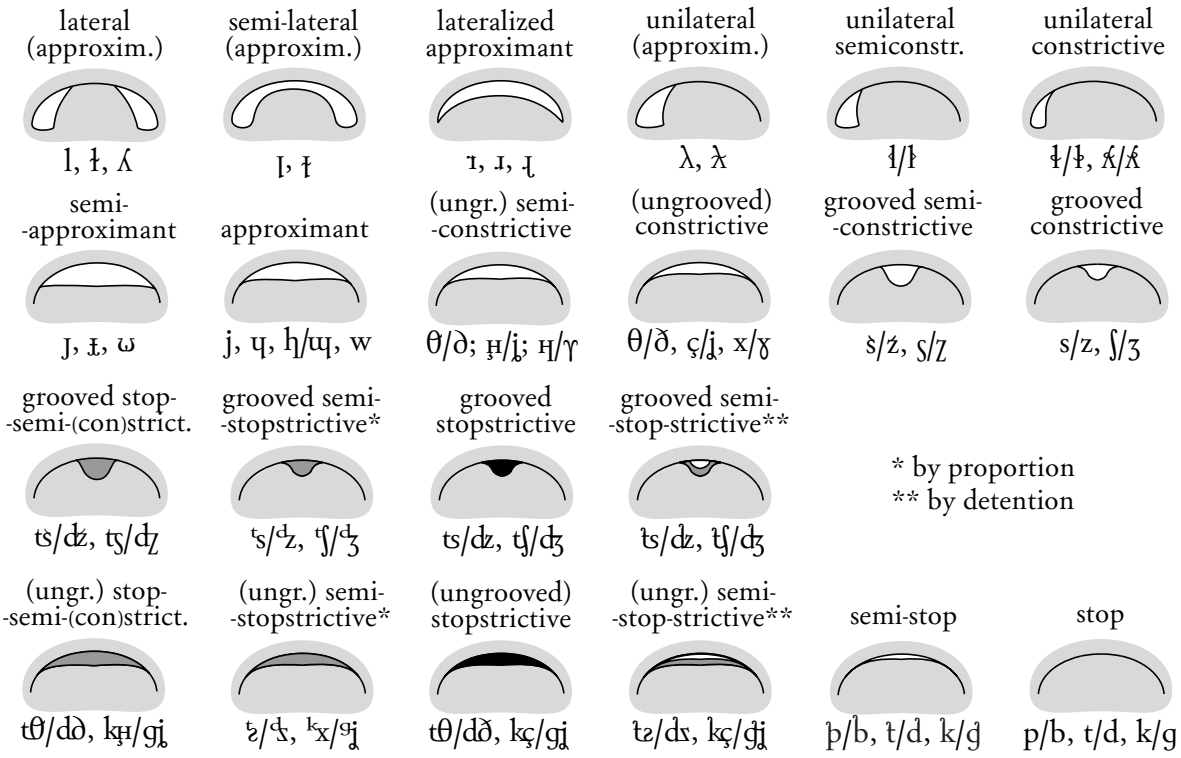
10.9.8. *fig* 10.9.9 shows some diagrams of frontal orograms, or *linguograms*, in order to help to visualize the slight mechanism which contributes to differentiate similar phones. Those in the middle concern the last three phones we have seen; the two on the sides highlight other interesting relations.

fig 10.9.9. Linguograms (or frontal orograms) showing a different perspective.



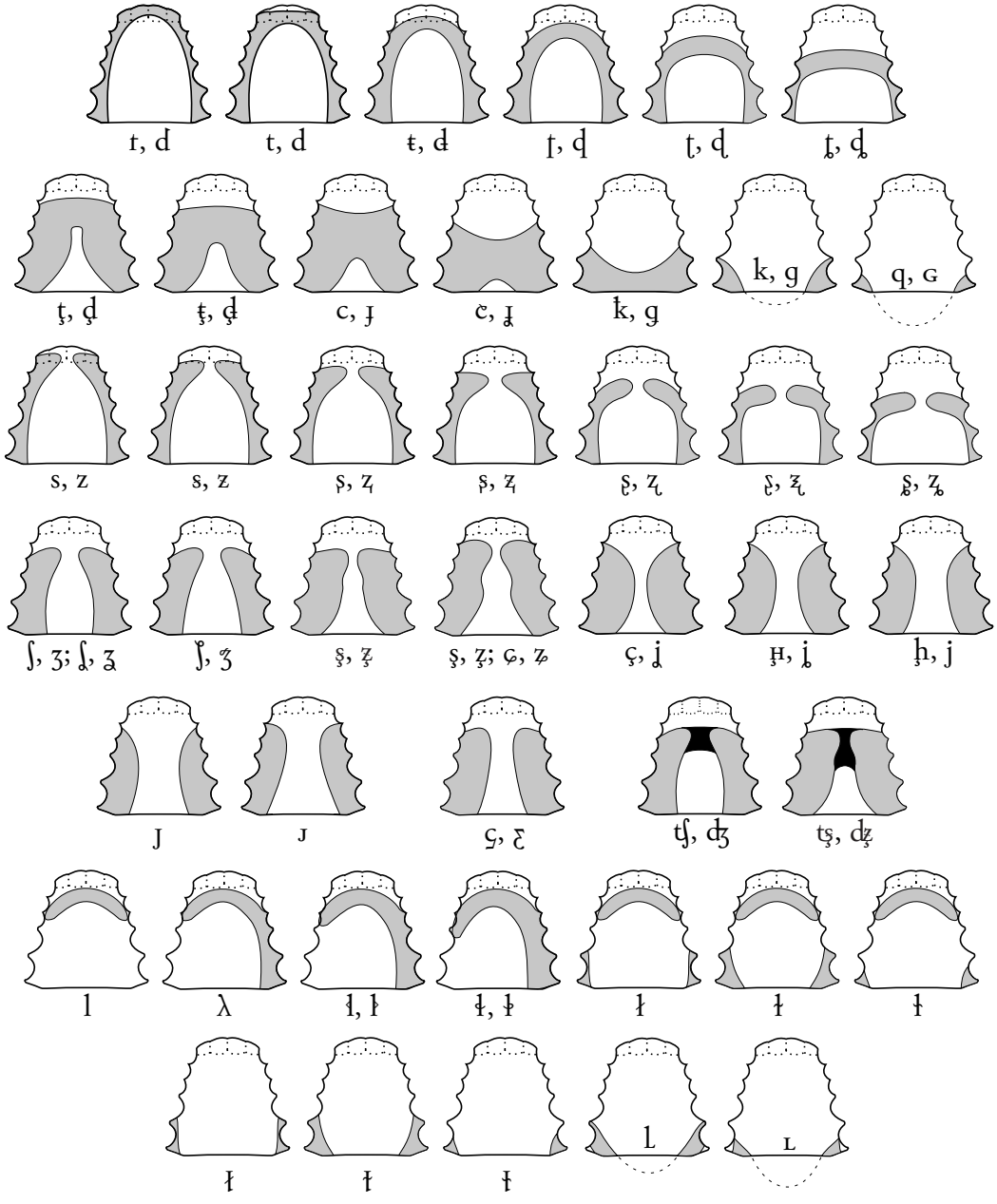
10.9.9. Here we add some more linguograms to better show the difference between certain (categories of) contoids already dealt with in this chapter. It is very important to accurately connect every linguogram to its articulatory chartacteristics.

fig 10.9.10. Further linguograms showing a different perspective for given contoid classes.



10.9.10. Palatograms are also very important to help to recognize some articulatory peculiarities which can make a real difference between similar phones. Thus, it is fundamental to accurately inspect all palatograms we are presenting here.

fig 10.9.11. Further different palatograms to be compared very attentively.



10.9.11. We also show the palatograms of all principal vocoids, because even comparisons between these two categories of phones can be very illuminating. But, first, let us show them in their vocograms (as in § 8)

fig 10.9.12. Vocograms with *canIPA* vocoids.

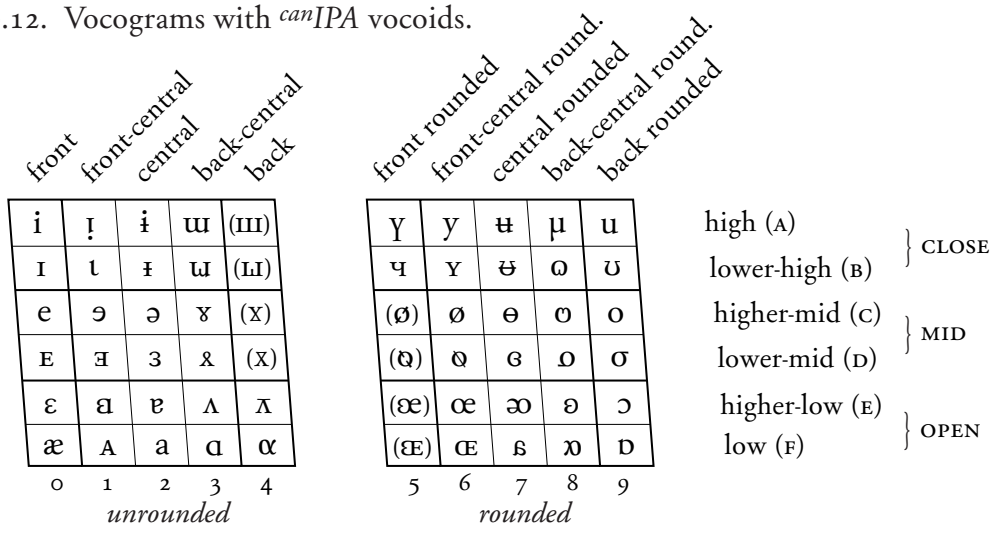
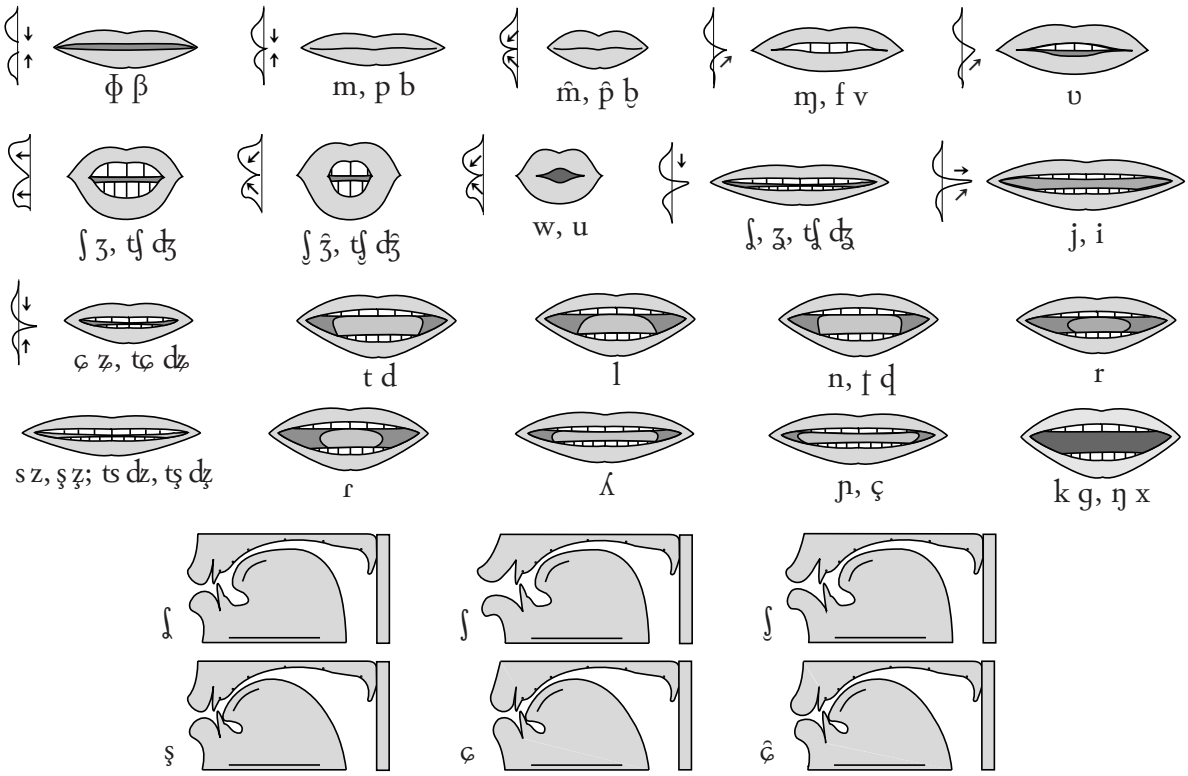


fig 10.9.13. Palatograms of *canIPA* vocoids.

10.9.12. Here is an expanded version of *fig* 9.1, which can complete this overview, to continue making useful comparisons between phones and some of their nuances.

fig 10.9.14. Contoid labiograms (and five orograms for the lips again).



'Aspiration' & coarticulation

10.9.13. Certainly, it will not be in vain to also reflect upon different possible degrees of '[h]' in various languages, either as a phoneme, /h/, or as an element of 'aspiration', either phonetic, for /C/, or phonemic, for /Ch/. As a matter of fact, it could be very important to be able to adequately distinguish, not only between (voiced or voiceless) laryngeal approximants, [h, ɦ], but also between laryngeal constrictives, [ẖ, ɧ] (cf § 10.6.4 & 10.5.2). And, in addition to a possible intermediate phonation type, [ɦ̞] (cf § 10.6.4.2), we can also find the corresponding semi-constrictive, [[ẖ, ɧ]] (formerly [[ɬ, ʜ]]), and semi-approximant, [[h̞, ɦ̞]] (formerly [[ʜ, ɧ]]), contoids – which are produced by using a lesser amount of air than the respective constrictive or approximant phones. However, the special symbols are not yet in great use.

This reflection can show that the VOT theory is a very weak one, since not only time, but also tension is important in the transitions from a phone to another.

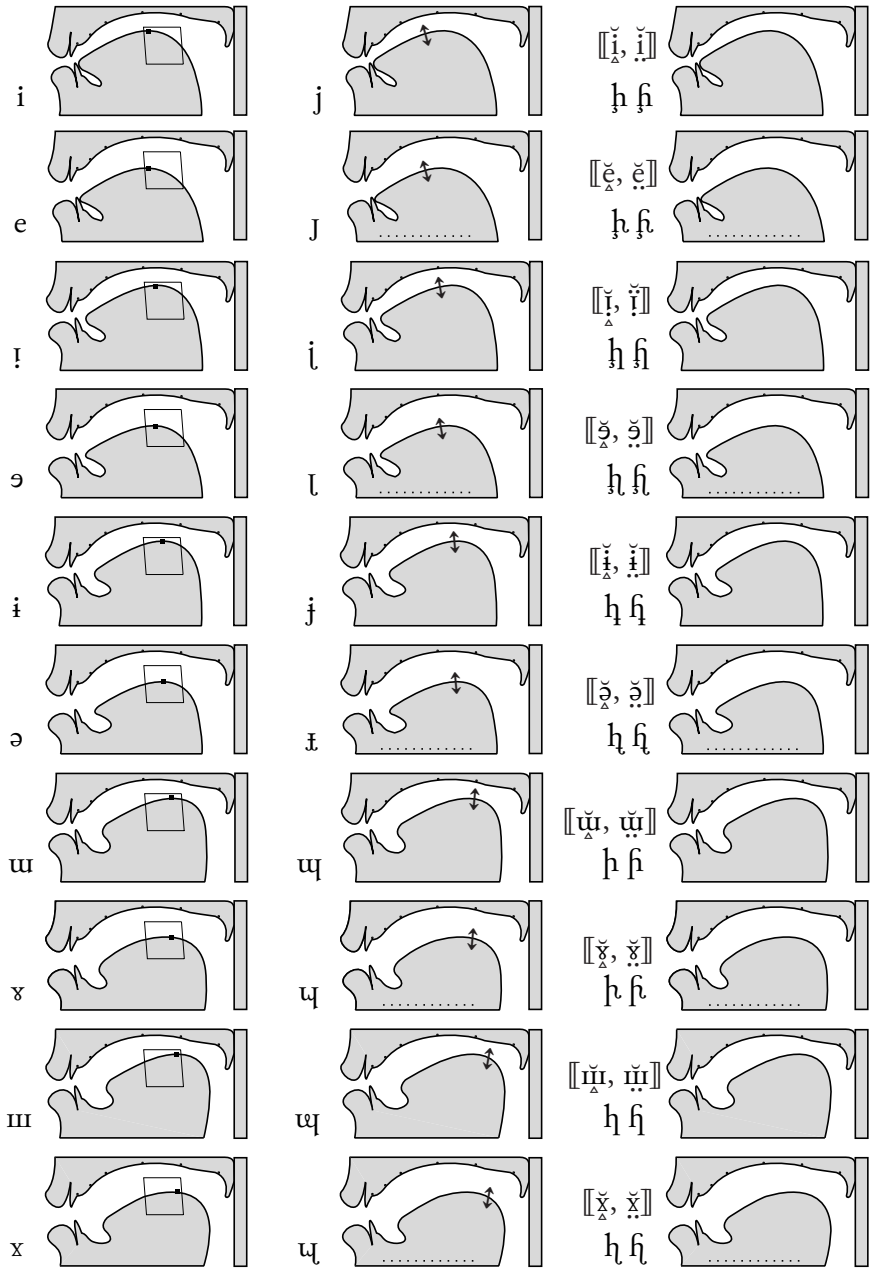
Unfortunately, as we know quite well, *offIPA* is nothing more than a phonemic alphabet (in spite of its official name: 'International Phon*etic* Alphabet', with some vague and curious definitions, too. It only has two voiceless and voiced 'fricative' (meaning *approximant*) sounds, /h, ɦ/ (beside oldfashioned, or provincial, '/ʍ/' –*ie* [hw, hw]– mostly for English *wh-*). In addition, let us notice that generally *offIPA* indicates any kind of 'aspiration' as /Cʰ/ – and also [Cʰ], even for voiced 'aspiration'.

10.9.14. What corresponds to /h/ [h] & /Ch/ [Ch]? Is it correct to represent the 'aspirate' /h/ as [h]? In fact, the *offIPA* current representation –/h/ [h]– is quite phonemic, but generally a satisfactory one, indeed.

The same is true for a general *canIPA* representation. As a matter of fact, even within *canIPA*, this is more than sufficient, due to normal automatic coarticulation. Of course, when the effect of coarticulation is stronger, *canIPA* shows it adequately (taking particular aims into consideration, as well), as we will see below, for more or less important nuances.

It would not be convenient to continuously notate expressly that we have (prevelar) [k̟] /k/ before front vowels. But –if we want to be realistic– we have to indicate a palatal [c] (or a pospalatal [c̠]) realization, when it realizes the (velar) /k/ phoneme, either before front vowels, or at the end of a word, as it happens in neutral French pronunciation: [ˈci, ˈmɛc] *qui*, *mec*. Of course, strictly speaking, a transcription like [[ki]] would not represent a natural /ki/ sequence in any real language. That is, a true *velar* stop, [[k]], would not be possible in any human language, in front of a true *palatal* vocoid like [[i]], because –by assimilation– the actual articulation of /k/ necessarily becomes prevelar, [k̟]. In fact, if we actually find something like [[ki]], the only possible natural phonemic sequence is /qi/, as in Arabic [qɪˈʃɑːni] *qīšānī*, which would rather be [[kɪˈʃɑːni]]. But, again, even in *canIPA Natural Phonetics*, it is better to simply transcribe [qɪ], because assimilation does the rest properly.

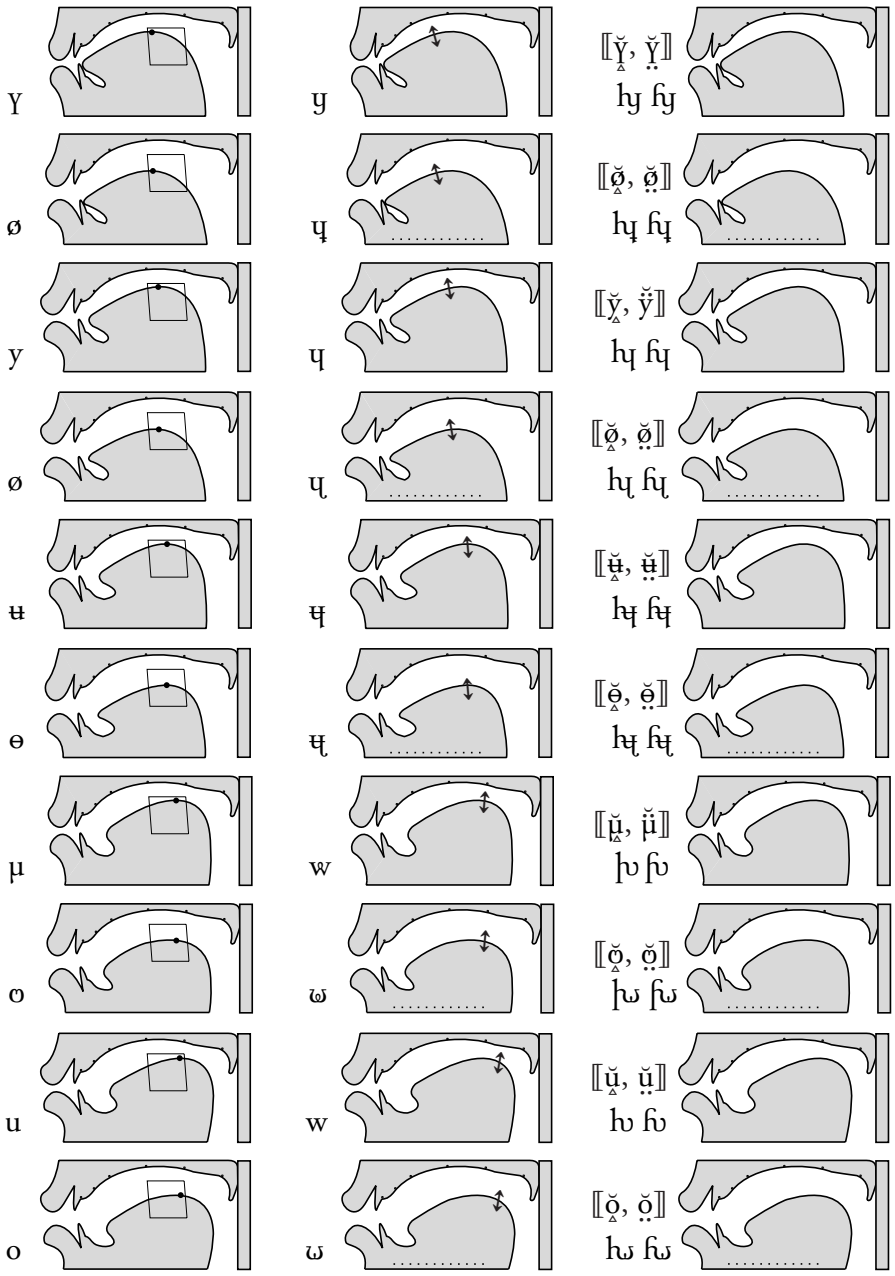
fig 10.9.15. Orograms of some unrounded vocoids and their corresponding dynamic & (more) static approximants & semi-approximants.



10.9.15. Going back to /hV/ sequences, we have (using examples for international-English pronunciation): [ˈhiiɪ] *heat*, [ˈhɪɪ] *hit*, [ˈhæɪ] *hat*, [ˈhɐɪ] *hut*, [ˈhɒɪ] *hot*, [ˈhuuɪ] *hoot*, [ˈhəːɪɪ] *hurt*. These transcriptions are quite sufficient for any human being. However, they would not be enough for a talking machine, unless a suitable adaptation is used, simply to take account of (natural) assimilation. In fact, to be true, in any /hV/ sequence, /h/ is realized as a voiceless (non-intense, or 'non-syllabic', ⟦ç̊⟧) contoid, perfectly corresponding to the vocoid that follows /h/, ⟦i̯̊⟧. These are all *canIPA* conventions that go far beyond poor *offIPA*.

This distinction between contoids and vocoids is fundamental, so the 'proper' *canIPA* transcription of the above examples would, then, be: ⟦ˈĭ̯ĭ̯iɪ, ˈɪ̯̆ɪ, ˈæ̯̆æɪ, ˈɐ̯̆ɐɪ,

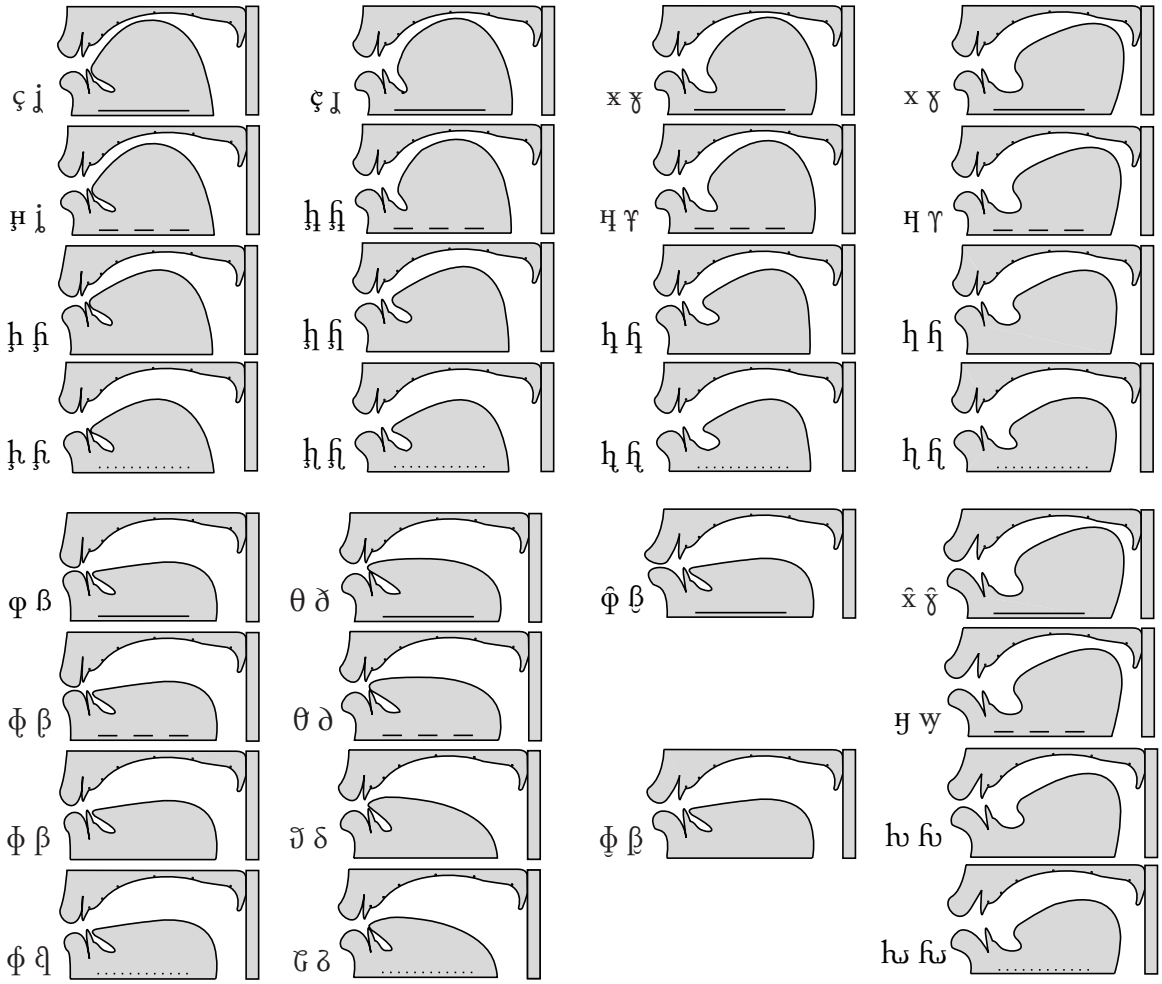
fig 10.9.16. Orograms of some rounded vocoids and their corresponding dynamic & (more) static approximants & semi-approximants.



ˈɒ̆ɒɪ, ˈʊ̆uuɪ, ˈɜ̆əˑɪɪ⟧ (or perhaps, by convention, ⟦V̆⟧: ⟦ˈĭiiɪ, ˈɪ̆ɪ, ˈæ̆æɪ, ˈăeɪ, ˈɑ̆ɒɪ, ˈŭuuɪ, ˈə̆əˑɪɪ⟧). And so on, for any further vocoids (and in any other languages). But it is perfectly clear that a notation like [h] is not only sufficient, but also remarkably simpler. In fact, otherwise, we should have further systematic symbols even for /hC/ sequences, like Burmese /hm, hn, hɲ, hŋ, hw, hl/ [hm, hn, hɲ, hŋ, hw, hl], *ie* ⟦ɦm, ɦn, ɦɲ, ɦŋ, ɦw, ɬl⟧.

10.9.16. Furthermore, many languages have phonemic sequences like /Ch/, or at least phonetic ones, [Ch]. Let us see a few (international-English) examples: [ˈphliˑiˌ] *please*, [ˈkhɹuˑu] *crue*, [ˈɬhwaɛs] *twice*, which should be rendered as:

fig 10.9.17. Palatal, postpalatal, prevelar, velar & laryngeal possible taxophones (with bilabial rounding, too). They can belong to the constrictive, semi-constrictive, approximant or semi-approximant classes (according to our Natural Phonetics conventions).



[[ˈpl̥liːiz̥, ˈkɹ̥ɹuːu, ˈʈw̥waɛs]] (and other more cumbersome combinations). Thus, it is very clear that the notation with [h] is the more convenient (and even *natural*) one: [hV, hC, Ch]. This is a serious problem only for talking machines, not for human speakers (and hearers).

In German, 'aspiration' is generally stronger than in English, *cf*: [ˈphl̥ats] ([[ˈpl̥l̥ats]]) *Platz*, as compared with [ˈphlæn] [[ˈpl̥læːn]] *plan*. This can be indicated –and even more clearly, indeed– while keeping the [h]-notation, as we have just seen. In Danish, an even stronger 'aspiration' occurs for /ˈʈh/, which shows its strength changing a stop into a stopstrictive: [ˈʈsh].

10.9.17. In Mandarine Chinese, 'aspiration' is distinctive and still somehow stronger. In fact, according to stress, we find, for instance: /ph/ [ˈpʰ, ˌph, ˌ̥p]; while the 'un-aspirated' counterpart is: /p/ [ˈp̓, ˌb̥, ˌ̥b], and so on. As can be seen, we have /ˈph/ [pʰ] (a sequence of a stop and a true constrictive laryngeal contoid), while, in completely unstressed syllables, we find /ˌ̥ph/ [p], *ie* a non-aspirated taxophone for an 'aspirated' phoneme.

Other languages, mostly Indian ones, such as Hindi, can oppose voiceless /Ch/ sequences to voiced ones: /C̬h, C̬ɦ/. On the other hand, in Mandarin Chinese, the 'aspirate' /h/ has three different 'normal' voiceless taxophones: [ˈʁ, ˌʁ, ˌʰh] (respectively: uvular semiconstrictive, uvular approximant, and velar approximant). In Korean, both /h/ and /Ch/ have [ɻ] + /i, j/, [hʊ] + /u, w/, [ɧ] + /ɯ/. Guarani has tautosyllabic /Vh/ sequences as [iɻ, ɯɧ, uhʊ].

10.9.18. Even without having to invent all possible ('un-diacritical') symbols for the assimilatory taxophones seen above (and their possible extensions), *canIPA* has a number of phones and symbols to adequately account both for coarticulation *assimilation* and for gradation *tension*.

In fact, not only the 'aspirate' /h/, but also 'aspirated' consonants (such as /kh, ʧh, sh/) can vary, first of all, because of differences in their tension. Thus, any /h/ (alone or in combinations) can range from true *constrictives* [ɦ, ɧ] (and semi-contrictives [ɦ̞, ɧ̞], formerly shown as [ɬ, ɬ̠]) to true *approximants* [h, ɦ] (and semi-approximants [h̞, ɦ̞]) – including voicing lenition, with voiced phones (and semi-voiced ones, too).

Besides, in addition to plain laryngeal phones /h, ɦ/, a number of assimilatory coarticulations can be added to them, especially in correspondence to vocoidal phones. As a matter of fact, such coarticulations are quite peculiar, so that they are easily noticed (sometimes even by laymen). In particular, ƒig 10.9.15-16 show 20 (and 20 further voiced) approximants (and semi-approximants), corresponding to as many high and higher-mid vocoids (and to their matching dynamic contoids, too). Their points of articulation are: *palatal*, *pospalatal*, *prevelar*, *provelar* and *velar* (including bilabial rounding, too).

The 'color' of /h/, then, depends mostly on the phone that follows it. In the case of /VhV/, of course, the 'color' can be determined also by the vocoid that precedes /h/, according to languages and accents. The influence of two vocoids alike, or similar, is necessarily stronger than that caused by very different, or opposit, vocoids. Thus, just showing very general, and extreme sequences, we might consider: [ihi, aha, uhu] or else [iha, ihu, uhi, uha, ahi, ahu].

10.9.19. Frequently, however, this assimilatory strength derives not only from a *following* vocoid (or a sonant contoid). In fact, also a *preceding* vocoid can determine their (places of) articulation. ƒig 10.9.17 shows further contoidal orograms (including some approximants and semi-approximants already seen in ƒig 10.9.15-16). They belong to the four classes of (semi-)constrictives and (semi-)approximants, and can be used by several languages, both for /hV/ and /Ch/ sequences.

They can also represent the taxophonic realizations of other phonemes, such as Spanish /s/, mostly in /sC/ and /s#/ sequences (but also, in /s#V/ sequences; more rarely so for /VsV/). For instance, some accents of Spanish can have /s/ [ʂ, h, ɧ, ɦ̞, hʊ], respectively, in sequences of /i, e, a, o, u/ + /sC/, depending on the preceding vowel; or they can have [ɸp, ϑt, ɧk], depending on the following consonant, and so on. Sometimes, they are even (unprecisely) represented as '/hC/' (and defined as 'aspiration', too).

10.9.20. In *fig* 10.9.15-16 (and related sections) we saw that various [h]-type contoids could be shown as certain unsyllabic (or loose) vocoids: generically ⟦V̬⟧. Now, to help to connect phonic things more completely, we will briefly show how given vocoids (using some of the same) could be rendered as intense (or 'syllabic') types of voiced [h]: generically ⟦ɦ̩⟧, thus gaining a full-voice status, just as normal vocoids (although starting from a lenis-voice situation). For instance: [i] ≡ ⟦ɦ̩⟧, [y] ≡ ⟦ɦʮ⟧, [ɯ] ≡ ⟦ɦ̩⟧, [u] ≡ ⟦ɦ̹⟧; [e] ≡ ⟦ɦ̩⟧, [ø] ≡ ⟦ɦʯ⟧, [ə] ≡ ⟦ɦ̩⟧, [ɤ] ≡ ⟦ɦ̞⟧, [o] ≡ ⟦ɦ̹⟧. Of course, this is just a mere reflection, to deepen the subject, as a useful articulatory and auditory introspection. In fact, nobody would ever suggest using such loose vocoids, or intense contoids, in transcribing current texts.

A couple of semiconstrictive laterals

10.9.21. As we know, constrictive laterals, like [ɬ, ɮ], can be used even as phonemes, for instance in Zulu and (only the voiceless one) in Welsh. They are also frequently used as a well-known speech defect, for /s, z/ (and, sometimes, for /ʃ, ʒ/, and possible connected stopstrictives). They are generally realized as alveolar and palatal, [ɬ, ɮ], [ʎ̟, ʎ̠]. Sometimes, the defect is milder, perhaps, in an attempt to solve the problem and avoid the broader realizations, by trying to form the necessary groove on the lamina. In fact, we can hear semiconstrictive contoids: [l̠, l̠], [ʎ̟, ʎ̠] (*cf fig* 10.9.10-11). For instance, *Miss* [ˈmɪl̠], *cash* [ˈkhæʎ̟]; Italian *passo* [ˈpal̠ːl̠o], *pesce* [ˈpeʎ̟ːʎ̟e]. Of course, their orograms are intermediate between those of [l̝, l; ʎ̝, ʎ] and [ɬ, ɮ; ʎ̟, ʎ̠].